Canadian Air Safety Board
Bureau canadien de la sécurité aérienne

Aviation Occurrence Reports

Issue 3

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AVIATION OCCURRENCE REPORTS

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FOREWORD

AVIATION OCCURRENCE REPORTS

In accordance with the CASB Act, part of the Board's objective is to report publicly on its investigations, on the related findings, and on any recommendations designed to eliminate or reduce safety deficiencies.

Therefore, this publication, AVIATION OCCURRENCE REPORTS, presents reports on CASB investigations, findings, and recommendations as adopted by the Board. The sole intent in providing this information is to advance aviation safety. It is not the object of the Board to determine or apportion any blame or liability in connection with aviation occurrences.

Anyone wanting to employ the AVIATION OCCURRENCE REPORTS for purposes other than advancing aviation safety could find the information incomplete.

This publication is also available in French.

Cette publication est également disponible en français.

A limited number of copies of this publication are retained and are available from:

On peut obtenir des exemplaires de la présente publication en nombre limité auprès du:

Canadian Aviation Safety Board
P.O. Box 9120
Alta Vista Terminal
Ottawa, Ontario
K1G 3T8

Bureau canadien de la sécurité aérienne
C.P.9120
Terminal Postal Alta Vista
Ottawa (Ontario)
K1G 3T8

This publication contains reports of aviation occurrences, in Canada, involving Canadian or foreign-registered aircraft.

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EXPLANATORY NOTES

Types of Reports

The CASB currently produces three types of occurrence reports. The most common format is the Summary Report which summarizes the details of the investigation in one or two pages. The next level is the Intermediate Report which is somewhat longer and more detailed. For both these types, the complete public report is reproduced in this publication. More factual information is available on Summary and Intermediate Reports and can be obtained by contacting the CASB and referencing the report number. Finally, a small number of investigations (generally 15 to 20 per year) result in International Civil Aviation Organization (ICAO) format reports. For the latter type of report, only the Synopsis and the Conclusions and Recommendations sections of the report are included in this publication. The full report can be obtained by contacting the CASB and referencing the report number (which is included with the Synopsis). Laboratory reports, if laboratory analysis has been carried out, are available for all three categories of reports and can be obtained in the same manner.

Grouping of Reports

For ease of reference, the reports in this publication are grouped by broad category of aircraft type and by type of operation within each group. The reports are then presented chronologically (by the date of the occurrence) within each subgroup.

For fixed-wing conventional aircraft, the first subgroup is Public Transportation. This includes scheduled, other unit toll, and charter operations. Note that this subgroup is further divided into occurrences involving (i) aircraft of 5 700 kg (12,500 lb) or over and (ii) aircraft under 5 700 kg (12,500 lb). The second subgroup is Commercial Training. This includes licensed flying clubs and commercial specialty training (commercial licence classes 6 and 7, respectively). All other types of fixed-wing aircraft commercial operations are grouped under Other Commercial Operations. The Private aircraft subgroup includes all privately registered aircraft, both personal and corporate. It is further subdivided according to type of landing gear. The final subgroup contains occurrences involving state-owned aircraft.

For the rotary-wing category, there are fewer aircraft and fewer occurrences. Thus, only three subgroups are used, viz. Commercial, Private, and State.

The final category contains occurrence reports for all other types. This includes amateur-built aircraft, ultralights, gliders, balloons, etc.

Contents of Summary Reports and Intermediate Reports

Information on Aircraft:

The first block of each report identifies the type of aircraft involved in the occurrence, the model, the registration, the location, and the date of the occurrence; for commercially operated aircraft, the operator is also identified.

Occurrence Report Number:

The second block commences with the occurrence report number,(any queries to the CASB should carry this reference). The first two numbers identify the year of the occurrence, the first letter identifies the CASB office that conducted the investigation ('A' - Atlantic, 'Q' - Quebec, 'O' - Ontario, 'C' - Central, 'W' - Western, 'P' - Pacific, 'H' - Head Office). The first number after the letter identifies the year of the decade of the occurrence. This block also contains information on the type of investigation (a correspondence investigation is one in which the site of the occurrence was not visited by a CASB investigator), the time of the occurrence, the type of operation, the extent of damage to the aircraft, and the type of licence held by the pilot.

Pilot Hours:

This block indicates the total number of hours the pilot had acquired on all types of aircraft, the total number of hours on type, and the number of hours flown in the last 90 days (in total and on type).

Injuries:

The injuries sustained by the crew, passengers, or others are classified as Fatal, Serious, or Minor/None (See Definitions).

Summary Report Narrative:

The narrative summarizes the history of the flight, pertinent factual information and analysis. The narrative is divided into two parts:

(a) the factual information or a description of what happened, which begins with a description of the history of the flight as close as possible to the occurrence, followed by the pertinent information; and

(b) an analysis of why the occurrence happened.

Findings:

The Board's findings from an investigation are grouped under two subheadings, as follows:

Cause-Related Findings: Any element of the occurrence, found during the investigation which, if removed, would have prevented the occurrence, or, if removed, would have avoided or reduced damage to property and people.

Other Findings: Information, discovered during the investigation of an occurrence, which is not cause related but has the potential to enhance or degrade aviation safety.

Safety Action:

For all aviation occurrence investigations, relevant data are recorded to facilitate statistical analysis and the identification of system-wide safety deficiencies through safety studies. In cases where an individual occurrence investigation leads to significant safety action being taken, that action is included in the public report immediately after the Findings.

Aviation Safety Recommendations

Regardless of the type of occurrence report, if the investigation leads to the issuance of a CASB Aviation Safety Recommendation, it is included in the Safety Action section of the report. Additionally, all Aviation Safety Recommendations issued during the preceding reporting period are summarized beginning at page 221 of this publication.

DEFINITIONS

(Extracted from the Canadian Aviation Safety Board Act/Regulations)

"AVIATION OCCURRENCE"

(a) any accident or incident associated with the operation of aircraft, and

(b) any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in paragraph (a).

"ACCIDENT"

"ACCIDENT" means any aviation occurrence where, at any time during the period commencing when the first person boards an aircraft for the purpose of flight and ending when the last person disembarks from the aircraft after the flight,

(a) a person other than a stowaway, sustains a serious injury or fatal injury, that is not self-inflicted or inflicted by another person or caused by natural causes, as a result of that person

   i) being in the aircraft,

   ii) coming in direct contact with any part of the aircraft, including any part that may have become detached from the aircraft, or

   iii) being directly exposed to the jet blast of the aircraft,

(b) the aircraft sustains damage or structural failure adversely affecting the structural strength, performance or flight characteristics of the aircraft and normally requiring major repair or replacement of any affected component part, other than damage or failure that is limited to

   i) the engine, its cowling, or its accessories,

   ii) the propellers, wing tips, antennae, tires, brakes or fairings, or

   iii) small dents or puncture holes in the aircraft skin, or

(c) the aircraft is missing or is completely inaccessible.

"SERIOUS INJURY"

"SERIOUS INJURY" means an injury that is sustained by a person in an accident and that

(a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was sustained,

(b) results in a fracture of any bone, other than a simple fracture of the nose or of any fingers or toes,

(c) involves lacerations that cause severe haemorrhage or nerve, muscle or tendon damage,

(d) involves injury to any internal organ, or

(e) involves second or third degree burns, or any burns affecting more than five per cent of the body surface.

"INCIDENT"

"INCIDENT" means an aviation occurrence, other than an accident, that affects or could affect the safe operation of an aircraft. Incidents can be reported to the CASB through mandatory or voluntary reporting mechanisms.

According to the CASB regulations a "reportable incident" means any incident involving an aircraft with a maximum certified take-off weight greater than 5 700 kg where

(a) an engine fails,

(b) smoke or fire occurs, other than an engine fire that is contained within the engine and does not result in engine failure or damage to other component parts of the aircraft,

(c) difficulties in controlling the aircraft in flight are encountered due to any aircraft system malfunction, weather phenomena, wake turbulence, operations outside the approved flight envelope, or uncontrolled vibrations,

(d) the aircraft fails to remain within the intended landing or take-off area, lands with one or more landing gear retracted, or drags a wing tip or engine pod,

(e) any crew member is unable to perform his flight duties as a result of incapacitation,

(f) decompression, explosive or otherwise, occurs that necessitates an emergency descent,

(g) a fuel shortage occurs that necessitates a diversion or requires approach and landing priority at the destination of the aircraft,

(h) the aircraft is refuelled with the incorrect type of fuel or contaminated fuel that is undetected prior to departure from the ramp,

(i) a collision or risk of collision with any other aircraft or with any vehicle, terrain or obstacle occurs, including a collision or risk of collision that may be related to air traffic control procedures or equipment failures,

(j) a flight crew member declares an emergency or indicates any degree of emergency that requires priority handling by an air traffic control unit or the standing by of crash, fire fighting or rescue services, or

(k) toxic gases or corrosive materials leak from any cargo aboard the aircraft.

SECTION I

FIXED-WING CONVENTIONAL AIRCRAFT

NORTHWEST ORIENT AIRLINES
MCDONNELL DOUGLAS DC-10-20 N162US
WINNIPEG INTERNATIONAL AIRPORT, MANITOBA
18 DECEMBER 1983

REPORT NUMBER: 83-C34901 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0845 CST
OPERATION: Scheduled International
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	13,270	111
LAST 90 DAYS	122	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	11
PASSENGERS	-	-	270

SUMMARY REPORT:

The aircraft was departing for a scheduled flight from Winnipeg to Minneapolis and Tampa Bay. Several minor technical problems related to the "cold soaked" conditions of the aircraft had delayed the flight. Because of the slippery ramp, the attempts to push-back the aircraft from the departure gate with a tow vehicle were unsuccessful. A second tow vehicle was required, and the two vehicles were able to accomplish the push-back. The aircraft engine starts were commenced during the push-back.

Successful starts were achieved on the number 1 and 2 engines. Following the departure of the tow crew, several unsuccessful attempts were made to start engine number 3. Fuel from the engine pooled on the tarmac and was ignited by a flame coming from the tail pipe of engine 3. The fire damaged the number 4 and number 8 wheels before it was extinguished by nearby ramp crews. The aircraft was towed back to the gate, and the passengers deplaned normally.

Several factors led up to the incident. Because the flight was late and the working conditions were extremely cold, the ground start crew was instructed to disconnect their equipment and clear the area before all three engines were started. This was because they had been released by the captain. The pooling fuel on the tarmac from the unsuccessful starts was not observed, which led to further engine start attempts under hazardous conditions. It was determined that the number 3 engine would not start properly because of intermittent igniter operation.

.../2

FINDINGS:

Cause Related:

1. Attempts to start engine number 3 were unsuccessful because the ignition system was operating intermittently.

2. The unsuccessful starts resulted in fuel pooling on the tarmac.

3. No ground crew was in place to observe the start attempts, because they had been released by the captain.

4. Flame from the number 3 engine tailpipe ignited the pooled fuel.

Other:

-- Nil --

21/11/85

AIR CANADA
DC9 - 32 C-FTMV
PEARSON INTERNATIONAL AIRPORT
20 FEBRUARY 1984

REPORT NUMBER: 84-044016 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1257 EST
OPERATION: Scheduled
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

On roll-out from a normal landing the aircraft turned onto a taxiway. During the turn the nosewheel hit a snowdrift rendering the nosewheel steering ineffective.

The turn could not be completed. The lack of steering combined with the effect of the wind on the aircraft caused the aircraft to continue straight ahead. Snow limited the braking action, however the aircraft was stopped before the nosewheel slid off the taxiway.

A tractor was used to realign the aircraft with the taxiway, and as there was no damage to the nosewheel assembly, the aircraft continued unassisted to the gate.

FINDINGS:

Cause Related

1. The turn onto the taxiway was hindered by a snowdrift and wind.

Other

- Nil -

19/10/85

This occurrence was investigated initially by the Aviation Safety Bureau of Transport Canada. The continued investigation and review were conducted jointly by the Aircraft Accident Review Board and the Canadian Aviation Safety Board. The purpose of the investigation is to advance aviation safety not to determine or apportion any blame or liability.

AVIATION OCCURRENCE REPORT

AIR JAMAICA
BOEING 727-2J0 6Y-JMA
TORONTO/LESTER B. PEARSON AIRPORT,
TORONTO, ONTARIO
17 JUNE 1984

REPORT NUMBER 84-040903

SYNOPSIS

The aircraft was on an international flight from Kingston, Jamaica to Toronto/Lester B. Pearson Airport, Canada. During an instrument approach to runway 06 right, the aircraft deviated from the runway centre line and glide path after decision height was reached. While the captain was attempting to regain the centre line, visual reference was lost, and the aircraft touched down on the grass to the right of the runway. There were no injuries to the passengers or crew, but the aircraft was substantially damaged. The report concludes that the deviation from the runway centre line combined with the loss of visual reference at low altitude placed the aircraft in a position from which the captain was unable to recover.

Ce rapport est également disponible en français

12 December 1985

3.0 CONCLUSIONS

3.1 Cause-Related Findings:

1. The aircraft deviated above the glide path as the captain made the transition to visual flight.
2. The aircraft deviated to the left of the runway centre line when the captain made the transition.
3. Forward visual reference was lost as the aircraft moved out through the leading edge of the rain cell into an area where the fog had not yet dissipated.
4. A go-around was not attempted as the captain considered that there was insufficient altitude to prevent the aircraft from touching down.
5. The aircraft touched down on the grass beside the runway.

3.2 Other Findings:

1. The RVR was sufficient to permit the approach to be flown.
2. The flight crew established visual reference before descent was continued below decision height.
3. The instrument approach plate used by the crew was produced by Air Canada and showed the Air Canada RVR minimum of 1,800 feet, not the 2,600 feet Air Jamaica required.
4. There was no evidence of any airframe failure or system malfunction prior to or during the flight except for the unserviceable autopilot.
5. The flight crew was certified and qualified for the flight in accordance with regulations.
6. The aircraft was certified, equipped, and maintained in accordance with regulations and approved procedures.
7. The aircraft's weight and centre of gravity were within the prescribed limits.

4.0 RECOMMENDATIONS

4.1 Actions Taken

No urgent safety action or interim recommendations were initiated by the Canadian Aviation Safety Board (CASB) as a consequence of this accident.

4.2 Further Actions Required

4.2.1 Instrument Approach Charts Adherence to Operating Certificate Limits

The CASB questions the effectiveness of the control exercised by the Department of Transport over foreign carrier Operating Certificates and procedures. Specifically, the Operating Certificate issued to Air Jamaica by the Department of Transport stated that while operating in Canada, instrument approach procedures used by Air Jamaica were to adhere to the limits published in the Canada Air Pilot. During the CASB investigation of this occurrence, it was determined that Air Jamaica had used instrument approach charts produced by Air Canada; these contained lower visibility limits than the Canada Air Pilot.

While it is recognized that an air carrier is not prohibited from using instrument approach charts other than those contained in the Canada Air Pilot, the Board believes that the approach limits used by an air carrier must not be lower than the approach limits specified in the air carrier's Operating Certificate. Consequently, the CASB recommends that:

a) Prior to the issuance of an Operating Certificate, the Department of Transport determine that the instrument approach charts used by the air carrier are consistent with the limits specified in the Operating Certificate; and

b) The Department of Transport develop procedures to periodically ensure that the limits portrayed on instrument approach charts used by an air carrier accurately reflect the limits specified in that air carrier's Operating Certificate.

CASB 85-27

AVIATION OCCURRENCE REPORT

NORDAIR LTD.
BOEING 737-200 OO-SDE
OTTAWA AIRPORT, ONTARIO
18 FEBRUARY 1985

REPORT NUMBER: 85-054025 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1722 EST
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	5
PASSENGERS	-	-	53

HISTORY OF THE FLIGHT:

As the aircraft approached the threshold of runway 32, a ground vehicle clearing snow off Juliet taxiway was observed proceeding toward the edge of runway 32. The flight crew carried out a missed approach and landed safely on runway 25.

PERTINENT INFORMATION:

Runway 25 was being used for departures and arrivals. This permitted snow-sweeping of Juliet taxiway which is adjacent to runway 32. To complete the snow-sweeping runs the ground controller, with the approval of the tower controller had cleared the snow-removal equipment to turn around on runway 32. While the snow-sweeping operation was in progress, the tower controller issued a clearance to a Boeing 737-200 for a visual approach and landing on runway 32.

ANALYSIS:

The tower controller did not advise the ground controller that the aircraft had been cleared to land on runway 32 until the Boeing 737-200 was on short final. As a result, there was insufficient time to advise the ground vehicles to remain well clear of the runway. The lead vehicle stopped when instructed by the ground controller to remain clear of the runway, but as the vehicle was already close to the runway edge, the driver attempted to turn away in order to remain clear. This turn brought the front of the vehicle on to the runway.

... /2

FINDINGS:

Cause Related:

1. The tower controller did not advise the ground controller that an aircraft had been cleared to land on runway 32 until the aircraft was on short final for that runway.

2. The ground controller was not aware of the aircraft until it was on short final.

3. The operator of the snow-removal equipment was not given enough time to remain well clear of the runway.

4. In order to remain well clear of the runway, the driver made a turn that brought the vehicle momentarily on to the runway.

Other:

- Nil -

03/10/86

The Canadian Aviation Safety Board reviewed this occurrence for the purpose of advancing aviation safety. It is not the object of the Board to determine or apportion blame or liability.

AIRCRAFT ACCIDENT

AUSTIN AIRWAYS
DE HAVILLAND OF CANADA LTD.
DHC-6 C-GTLA
LANSDOWNE HOUSE, ONTARIO
23 NOVEMBER 1983

REPORT NUMBER 83-H30007

The accident was investigated by the former Aviation Safety Bureau of Transport Canada; the report was reviewed and issued by the Canadian Aviation Safety Board.

SYNOPSIS

The aircraft was flying between Webequie and Lansdowne House, Ontario on a specific point service carrying passengers and freight.

While on approach in visibility reduced by snow, the aircraft touched down short of the runway, resulting in heavy structural damage. A post-crash fire ensued in which four passengers perished. Two crew members and one passenger escaped with injuries.

Ce rapport est également disponible en français.

23 October 1985

3.0 CONCLUSIONS

3.1 Cause-related Findings

1. The captain of the aircraft conducted a visual approach in limited visibility.

2. The crew experienced a whiteout condition during the approach and did not detect a descent below a safe altitude.

3.2 Other Findings

1. The surviving passenger reported that predeparture passenger briefings were not given by the flight crew.

2. A shutdown of the Kapuskasing FSS remote communications outlet without NOTAM and the unserviceable company transceiver at Lansdowne House restricted the crew's ability to obtain up-to-date weather and altimeter settings.

3. The crew did not attempt to obtain a weather briefing for Lansdowne House using the aircraft HF radio.

4. The company VHF transceiver was not reliable.

5. The cargo was not restrained.

6. The crash was survivable; however, four of the five passengers perished in the post-crash fire.

7. The Transport Canada publication "Aerodrome Standards and Recommended Practices" (TP321E) states that VASIS should be provided to serve the approach to a runway where the pilot may have difficulty judging the approach because of inadequate visual guidance. The approach to runway 26 meets that criterion.

8. The aircraft within the allowable weight and specified centre of gravity limits.

9. The aircraft was certified, equipped and maintained in accordance with existing regulations and approved procedures.

10. The flight crew was certified and qualified for the flight in accordance with existing regulations.

4.0 RECOMMENDATIONS

Actions Taken

No urgent safety actions or interim recommendations were initiated by the Canadian Aviation Safety Board (CASB) as a consequence of this accident.

Further Action Required

VASIS At Lansdowne House - The CASB notes that the approach for landing on Runway 26 at Lansdowne House positions the aircraft over a lake, creating difficulty in depth perception for the pilot conducting the approach. Transport Canada has published criteria to evaluate the requirement for VASIS on approaches to runways (see Appendix A); by these guidelines, the approach to Runway 26 qualifies for the installation of VASIS. Therefore the CASB recommends that:

> In accordance with Department of Transport criteria for the installation of VASIS, a VASIS (or some other approved equipment for visual assistance in judging from the cockpit the aircraft's position relative to the desired approach slope) be installed on Runway 26 at Lansdowne House, Ontario.
> (CASB-85-21)

Passenger In-flight Information - The CASB notes with concern that not all fare-paying passengers flying in Canadian-registered aircraft have access to information respecting the emergency equipment and exits of the aircraft. The applicable portions of the Air Navigation Orders (ANOs) Series VII (as presently constructed) require air carriers to provide this vital information in only the English and French languages. People who can read neither of the official languages may, therefore, be deprived of potentially life-saving information. Accordingly, the CASB recommends that:

> The Department of Transport amend Air Navigation Order Series VII Number 2 paragraph 18(4) and Air Navigation Order Series VII, Numbers 3 and 6, paragraphs 19(4) to require that in all cases the information described in subsection (3) of the aforementioned paragraphs be pictorially depicted.
> (CASB-85-22)

Procedures for Elective Maintenance on Communications and Navigational Equipment - The CASB is concerned that internal guidelines within the Department of Transport for conducting elective maintenance on navigational and communications equipment are not sufficiently restrictive to safeguard aviation safety.

Specifically, there are no standardized weather minima criteria applicable nation-wide below which elective maintenance of navigational and communications equipment is prohibited. The authority to shut down en-route navigational and communications equipment rests with the Flight Service Specialist, after he has co-ordinated the activity with the appropriate air traffic control (ATC) unit(s) and maintenance personnel, and in the case of scheduled shutdowns, has received the approval of ATC.

The procedures are designed to provide the Flight Service Specialist with all available information before elective maintenance is authorized. However, as the events at Lansdowne House illustrate, these procedures do not provide the Specialist with all information about VFR flight-planned traffic. Furthermore, the Specialist is not required to consider either the forecast or the prevailing weather. Accordingly, the CASB recommends that:

> The Department of Transport amend its procedures for conducting elective maintenance on navigational and communications equipment to prescribe minimum weather conditions below which elective maintenance shall not be conducted. (The CASB suggests that such weather minima should in no case be less than VFR flight minima and that higher minima may be warranted in some locations).
>
> (CASB-85-23)

Aviation Safety Education - The CASB lauds the continuing efforts of the Department of Transport to publicize matters pertaining to aviation safety amongst members of the aviation industry and the general flying public. This is done through the publications and presentations of the Aviation Safety Promotions Division of the department and by departmental inspectors while conducting company audits and inspections. The CASB feels that the contents and findings of this investigation report may be valuable in the promotional endeavours of Transport Canada (Air) and accordingly recommends that:

> The Department of Transport effect wide dissemination of information from this accident for safety educational purposes, particularly as it pertains to:
>
> a) the advisability of maintaining company air-to-ground transceivers in good working order and of air crews making use of all available communications equipment to remain abreast of information pertinent to their flight;
>
> b) the importance of clear and disciplined inter-crew communications in flights conducted in both VFR and IFR flight conditions;
>
> c) the importance of cargo being restrained sufficiently well to remain secured if the aircraft is exposed to survivable impact forces; and
>
> d) the hazard of whiteout conditions and the adverse effect which obscuring ground-based weather phenomena such as blowing snow can have on flight visibilities while approaching to land.
>
> (CASB-85-24)

ILFORD RIVERTON AIRWAYS LTD
CESSNA U206C C-FCUL
BIGG LAKE, MANITOBA
15 APRIL 1984

REPORT NUMBER: 84-C44013 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0930 CST
OPERATION: Charter
DAMAGE: None
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,552	200
LAST 90 DAYS	224	163

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The wheeled aircraft, equipped with a nosewheel ski, landed on the snow-covered ice surface of the lake and four passengers emplaned. As the aircraft taxied back to the take-off position, the main wheels broke through the ice, and the aircraft came to rest on its belly.

The pilot had landed the aircraft in the same area two days previously and he had landed on ice surface in different areas on the day of the incident. Recent daytime temperatures had been above freezing, and it had snowed the night before the incident. The ice where the aircraft broke through was one and one-half to two feet thick but was very weak; however, the pilot had been told by his supervisor that the ice would still be strong enough for continued operations. The evidence indicates that the pilot took normal precautions with regard to the strength of the ice.

FINDINGS:

Cause Related:

1. The ice was not strong enough to support the weight of the aircraft.

Other:

- Nil -

CESSNA 182P N6011F
FLIN FLON, MANITOBA 39 mi NNW
25 JUNE 1984

REPORT NUMBER: 84-C40906 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0815 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	430	14
LAST 90 DAYS	14	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	2	-

SUMMARY REPORT:

The aircraft was about 20 miles from destination over dense forest on a visual flight rules (VFR) flight of one hour's duration when the engine suddenly stopped. The pilot transmitted a "Mayday" call which included the aircraft's location and then attempted to carry out a forced landing into the trees. The aircraft struck the trees in a nose-down, right-wing-low attitude. The aircraft then travelled 42 feet through the trees before striking the ground. The nose gear separated, and the aircraft came to rest facing the approach path.

One passenger was killed and the other two seriously injured; the pilot escaped with minor injuries.

The investigation determined that both fuel tanks were empty at the time of the accident. The right fuel cap was hanging loose on its chain and its operating handle was unlocked and broken. A fuel stain was noted aft of the fuel filler neck on the right upper wing. The fuel selector was found in the "both" position. In this aircraft, when the fuel selector is on "both", fuel can flow from one wing tank to the other. Because the right fuel cap was not secured, the suction created in flight caused fuel to vent from the right tank. Fuel from the left tank flowed into the right tank and was also vented overboard.

When the engine stopped, the pilot noticed that the fuel gauges indicated that the right fuel tank contained a large amount of fuel and the left tank was nearly empty. In this model of aircraft, there is a placard adjacent to the fuel quantity gauges which states: "Caution, leaking fuel caps can cause loss of fuel and erroneously high fuel quantity indications." Because of the fuel leak, the right fuel gauge read incorrectly, and the pilot was unaware of the amount of fuel on board the aircraft.

It could not be determined why or when the right fuel tank cap was left in an unsecured condition. The pilot did not visually check the fuel load or position of the fuel caps before departure.

The aircraft was equipped with shoulder harnesses; however they were not worn. It is possible that the use of shoulder harnesses might have prevented the fatal injury.

.../ 2

06/08/86

FINDINGS:

Cause Related:

1. The right fuel tank cap was not secure for undetermined reasons.
2. The pilot did not check the security of the fuel cap during his pre-flight inspection of the aircraft.
3. The fuel was vented from the right fuel tank.
4. Fuel from the left tank flowed into the right tank because the fuel selector was in the "both" position.
5. The engine stopped when all aircraft fuel was vented.
6. Because the right fuel cap was not secured, the right fuel gauge did not read correctly.
7. The front-seat occupants were not wearing shoulder harnesses.

Other:

- Nil -

06/08/86

NEWFOUNDLAND LABRADOR AIR TRANSPORT LTD
CESSNA 185F C-GZDV
RICK'S LAKE, NEWFOUNDLAND
28 SEPTEMBER 1984

REPORT NUMBER: 84-A40024 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1300 NST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commerical

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,296	4,000
LAST 90 DAYS	300	300

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	-	1

SUMMARY REPORT:

The float-equipped aircraft was chartered to fly two hunters out of a hunting camp. At the time of take-off, there were intermittent snow showers, and the wind was blowing at 20 knots with gusts to 27 knots. Shortly after lift-off, at a height of 20 feet, the right wing dropped; despite the pilot's application of opposite aileron, the wing struck the water, and the aircraft flipped over onto its back. The pilot and rear-seat passenger exited the aircraft without difficulty; however, the front-seat passenger was unable to release his seat-belt. A knife was passed to the passenger by the pilot, and he attempted to cut himself free. He was unsuccessful, and the aircraft sank with the passenger on board.

When the body of the passenger was recovered, it was discovered that his lap belt was rotated 180 degrees, so that the release mechanism was facing inward against his body. Laboratory testing on the seat-belt was carried out using two individuals as test cases. One of the individuals was unable to open the lap belt with the belt in the rotated position.

.../2

29/09/86

The autopsy revealed that the passenger died of asphyxia due to drowning and that he had coronary heart disease.

Although the condition of the passenger's circulatory system suggests a possible heart attack, he appeared to be fully conscious throughout his attempts to free himself. The evidence indicates that he was unable to free himself because of the rotation of the seat-belt. It could not be determined why the seat-belt had rotated.

The aircraft was equipped with a Robertson short take-off and landing (STOL) kit. The kit manufacturer recommends two modes of operation in the supplement to the pilot's operating manual, normal and STOL. Normal operation calls for 20 degrees of flap for take-off, and the STOL operation calls for 30 degrees. Lift-off speeds quoted for normal and STOL operations are 50 mph and 46 mph respectively. The average stall speed is 40 to 42 mph. For both normal and STOL operations, the pilot cannot prevent the aircraft from lifting off at the lift-off speed. The effects of wind gusts and wave action may result in the aircraft becoming airborne before the lift-off speeds. In addition, the kit alters the stall characteristics of the aircraft such that there is no airframe buffet to warn the pilot that the aircraft is approaching the stall.

In this case, the pilot had selected 20 degrees of flap for take-off. Although the pilot could not recall his take-off speed, the aircraft would have become airborne at 50 mph or sooner, in this configuration. Therefore, if the aircraft encountered a seven-knot (eight-mph) decrease in wind speed, immediately after take-off as a result of the gusty wind conditions, the airspeed would drop to 42 mph and thus precipitate a stall. With an aircraft operating in the STOL configuration, an even smaller decrease in wind speed, as low as four mph, could produce a similar situation.

Although the STOL kit manufacturer recommends in their supplement to the pilot's operating manual 20 degrees of flap for normal operation take-offs, some operators of aircraft with Robertson kits select only 10 degrees of flap for take-off in strong winds, particularly cross-winds. This setting delays take-off until the airspeed has reached a safe margin above stall speed. This information has not been formally disseminated to all owners of the STOL kit.

The following laboratory report was completed: LP 67/85-Seat-Belt Test.

.../3

FINDINGS:

Cause Related:

1. The aircraft, which was equipped with a Robertson STOL kit, took off from a lake using 20 degrees of flap in strong gusty winds.
2. Immediately after lift-off, the aircraft stalled.
3. The front-seat passenger drowned in the aircraft because his seat-belt was rotated 180 degrees, and he was unable to release it.

Other:

1. The Robertson STOL kit reduces the stall margin of this aircraft type to the point where, on take-off, small variations in wind velocity can further reduce this stall margin to an unsafe level.

29/09/86

The Canadian Aviation Safety Board investigated this occurrence for the purpose of advancing aviation safety. It is not the object of the Board to determine or apportion any blame or liability.

AVIATION OCCURRENCE REPORT

WAPITI AVIATION LTD.
PIPER NAVAJO CHIEFTAIN
PA-31-350 C-GXUC
HIGH PRAIRIE, ALBERTA 20 mi SE
19 OCTOBER 1984

REPORT NUMBER 84-H40006

SYNOPSIS

The aircraft was on a night IFR flight from Edmonton to Peace River, Alberta with a planned stop at High Prairie. While cruising above cloud at 8,500 feet, the aircraft was cleared to descend to 7,000 feet, and the pilot commenced an en route descent towards the High Prairie Airport. The descent was continued in cloud to below the minimum obstruction clearance altitude. While still in cloud, at 2,350 feet asl, the aircraft struck high terrain 20 miles east southeast of High Prairie. Six passengers perished; the pilot and three other passengers survived.

Ce rapport est également disponible en français.

18 December 1986

3.0 CONCLUSIONS

3.1 Cause-Related Findings

1. The pilot, while on an IFR flight plan and in controlled airspace, knowingly descended below the airway published minimum en route altitude of 7,000 feet and the published minimum obstruction clearance altitude of 5,600 feet, while in instrument meteorological conditions.
2. The pilot descended without knowing his exact en route position.
3. An approved instrument approach procedure was not available for the High Prairie Airport.
4. Company management did not take effective steps to ensure adherence by the pilots to the Air Regulations and the procedures stipulated in the company's operations manual.
5. Transport Canada surveillance and audit procedures did not lead to the desired safe operations of this company.

3.2 Other Findings

1. At take-off, the computed all-up weight was approximately 7,400 pounds, approximately 400 pounds over the maximum allowable.
2. Pilots did not routinely complete weight and balance calculations as required by the company's operations manual.
3. The pilot filed a flight plan for a low level airway with only one serviceable ADF, an action which was in violation of the company's operating certificate.
4. It was company practice not to enter aircraft unserviceabilities in the journey logs.
5. Three out of four company management positions were held by a single individual; on occasion, this individual assumed all management positions in addition to some line-pilot flying duties.
6. The aircraft did not have any survival gear on board, nor was it required by regulation.
7. Had the pilot used the available shoulder harness, his injuries may have been minimized.

8. The movement of the ELT function switch could have jeopardized the success of an electronic search; on this occasion, the military search crews succeeded in homing in on the intermittent ELT transmission.

9. The cabin baggage was not stowed or secured for flight as required by regulation.

10. The pilot was certified and qualified for the flight in accordance with existing regulations.

11. The aircraft was certified in accordance with existing regulations.

12. There was no evidence of pre-impact failure of the aircraft or engines.

4.0 SAFETY ACTION

4.1 Action Taken

4.1.1 Instrument Approach Procedure, High Prairie Airport

The introduction of an approved NDB instrument approach procedure subsequent to this accident now provides pilots the opportunity to conduct an IFR approach at High Prairie, Alberta.

4.1.2 Company Safety Management Programs

Several findings from this accident pertain to company management practices. The Department of Transport has been conducting company safety seminars since January 1982 to instill safety principles in management decision-making. In addition, an Executive Safety Course was introduced in the fall of 1986 to motivate executive officers and senior managers to adopt safety programs for the companies they manage. This latest course illustrates both the benefits which can be acquired in a safety-conscious operation and the risks of succumbing to perceived short-term economic expedients. The Board supports these initiatives to help management decisions contribute to safe operations.

4.1.3 Department of Transport Surveillance

In November 1984, during the field investigation of this accident, the CASB issued Recommendation CASB 84-04 which proposed that the Department of Transport take immediate action to effect special surveillance of Wapiti Aviation Limited. The Minister of Transport responded on 04 February 1985 advising the Board that special surveillance had been conducted on the company. As a consequence of a comprehensive regulatory company audit conducted by Transport Canada (TC) in late 1984, Wapiti Aviation Limited was permitted to continue operations in 1985 with specific restrictions.

The investigation revealed a number of additional deficiencies regarding the planning and implementation of TC surveillance and audit procedures. All but one of these have been addressed by TC officials since the time of the accident; these are described in section 4.1.3.1 The one deficiency which has not been resolved to the Board's satisfaction is discussed in section 4.2.

4.1.3.1 Regional Master Surveillance Plan

Since the accident, the Aeronautics Act has been extensively revised; there are now strengthened provisions for enforcement and for the introduction of administrative fines which have added a much required flexibility to the options available to TC officials. Furthermore, the establishment and staffing of an Enforcement Division, which had started prior to the accident as a result of a recommendation issued by the Commission of Inquiry into Aviation Safety by the Honourable Mr. Justice Charles L. Dubin, has now been completed. Consequently, the Enforcement Division of the Western Region has expanded from two to five officers. The TC Western Region Master Surveillance Plan published in 1986 is a more comprehensive document than the plan which existed at the time of the accident. It now includes provisions for the establishment of a data base to store information on regulatory activities, thereby facilitating the forecasting of "problem areas" and the appropriate allocation of resources. The Board believes that these are positive measures which, if implemented effectively, will assist in the prevention of regulatory-related accidents.

4.2 Action Required

4.2.1 Department of Transport Surveillance

The CASB acknowledges the changes that have been made in the Department of Transport surveillance procedures in the TC Western Region. However, a well-conceived plan requires clear internal directives to be effective. One of the primary safety deficiencies identified in the accident was the inability of TC to respond effectively to the apparent unsafe operating practices of a company, despite an abundance of evidence: in the two years preceding the accident, regional Air Carrier Inspectors had expressed concern about the safety of the company; Airworthiness Inspectors discovered numerous irregularities in the maintenance procedures and record-keeping of the company; and ATC personnel issued IFR clearances to company aircraft for off-airways flight during conditions of IFR weather to an airport that was not served by an instrument approach. The Board is concerned that the ineffective identification and reporting of apparent unsafe practices, and/or a lack of coordination between divisions of TC may continue to degrade the effectiveness of routine surveillance, despite the enhanced sophistication of the current surveillance policy. The Board's concern extends beyond the TC administrative region in which this accident occurred. Accordingly, the CASB recommends that:

> The Department of Transport ensure that while implementing current administrative changes:
>
> a. there are adequate internal directives to fulfil the objectives of Regional Master Surveillance Plans; and that
>
> b. there is adequate coordination between the Air Navigation and Aviation Regulation directorates to provide effective surveillance.

(CASB-86-18)

4.2.2 Inadequate Emergency Equipment

A. Survival Equipment

The requirement to carry survival equipment on Canadian-registered aircraft in Canada is specified in Air Navigation Order (ANO) Series V, No. 12. Such survival equipment is only required for flights in the Sparsely Settled Area. Notwithstanding these provisions, the post-impact survival of aircraft occupants has been jeopardized in several accidents outside the Sparsely Settled Area because no survival equipment was carried on board (for examples, see Occurrence Reports 77-W70021, 80-000080, 83-P30021).

It is the Board's view that the current boundaries of the Sparsely Settled Area do not realistically account for the harsh conditions which survivors of accidents may encounter. In this case, the flight route and accident site were south of the Sparsely Settled Area. The accident aircraft was on an IFR flight with radar coverage for much of the itinerary; the accident occurred in proximity to a military Search and Rescue (SAR) facility; and the ELT search was successful. Yet there were significant delays in completing the rescue. Inaccessibility to the accident site, inclement weather conditions, darkness, and other factors may impede the evacuation of survivors who require supplementary equipment to survive the delays. Apparently, a principal criterion in the 1960s for determining the boundaries of the Sparsely Settled Area was the distance from military SAR facilities. The circumstances of this accident underscore the inadequacy of determining the boundaries of the Sparsely Settled Area by this criterion.

The Board is also concerned about the absence of survival equipment on small commercial passenger-carrying aircraft during winter operations. Modern large aircraft with extensive system redundancy, which operate from major airports, are less likely to require supplementary survival equipment. However, as the circumstances of this winter accident demonstrate, the harsh winter climate which can be encountered in Canada can jeopardize the lives of survivors of accidents involving small commercially operated aircraft. The operation of such aircraft is governed by ANO Series VII, Numbers 3 and 6, and the Board believes these Orders do not make adequate provision for the survival of fare-paying passengers on board aircraft in the event of a winter accident.

In view of the extreme environmental conditions that may face accident survivors, and in consideration of the circumstances which may adversely affect the time required for rescue, even outside the Sparsely Settled Area as currently defined, the Board recommends that:

> The Department of Transport review the adequacy of Air Navigation Order Series V, No. 12, particularly in consideration of the questionable validity of limiting the requirement for survival equipment to geographic location; and
>
> (CASB-86-19)
>
> The Department of Transport, having due regard to space and weight limitations while benefiting from advances in available lightweight materials:

a. prescribe a minimum list of survival equipment suitable for post-accident winter conditions; and

b. require the carriage of prescribed survival equipment on aircraft operating during the winter on passenger-carrying flights under the provisions of Air Navigation Order Series VII, Numbers 3 and 6.

(CASB-86-20)

B. First Aid Equipment

At the time of the accident, there was no requirement for the accident aircraft to carry first aid equipment. However, on 23 November 1985, the Privy Council gazetted a proposal by the Department of Transport to introduce the "Aircraft First Aid Kit Order". When this legislation is promulgated, it will require most aircraft to be equipped with at least one first aid kit.

The Board is encouraged that this Order is being introduced; however, the contents of the required kit are essentially for the treatment of minor injuries likely to occur in flight. Consequently, commercially operated, passenger-carrying aircraft will continue to be flown without adequate first aid equipment for the treatment of post-accident injuries. The Board believes that relatively inexpensive measures could be taken to better equip such aircraft for post-accident injuries. For example, such lightweight items as field dressings and wire or inflatable splints could be added to the first aid kits proposed in the First Aid Kit Order; or a sealed accident kit could be required for commercially operated aircraft to supplement the general first aid kit.

The Board does not wish to delay the promulgation of the "Aircraft First Aid Kit Order"; however, the Board believes that the proposed Order does not adequately provide for the treatment of post-accident injuries, and consequently recommends that:

The Department of Transport:

a. prescribe a minimum list of first aid equipment which, in the event of an accident, would supplement the supplies in the first aid kit specified in the "Aircraft First Aid Kit Order", and

b. require such equipment to be carried on commercial passenger-carrying aircraft.

(CASB-86-21)

4.2.3 Inadequacy of ELT Function Switch

Darkness prevented the survivors from determining the position selected on the emergency locator transmitter (ELT) switch; to overcome this deficiency, the ELT switch was moved from one position to another, regularly interrupting the ELT transmission. The success with which military SAR crews were able to home to the ELT transmission of Wapiti Flight 402 masks the safety deficiency associated with the function switch of this and other models of ELTs.

The deficiency was previously identified in an accident in 1977 (Refer to Occurrence Report 77-W70021). Two persons initially survived this earlier accident, but the pilot, who had lost his glasses during the impact, was further hampered from operating the ELT switch by darkness and a severe snow storm. He too sequenced the switch from one position to the other. The pilot of the first SAR aircraft airborne received a strong ELT signal which could not be localized due to the intermittency of the transmission. The wreckage was located two days later: the pilot had died from exposure, and the ELT switch was found in the OFF position where it had been left by the visually impaired pilot who was likely suffering from shock and exposure.

The Board believes that ELT function switches should be designed such that when placed in the ON position, they physically feel different than when in the OFF or ARM position. For instance, a "pull-up-and-over" toggle switch would assure the operator, who after the accident might be visually impaired, that the ELT switch was selected ON.

The Board believes that the chances of a timely and successful rescue may continue to be undermined by an ELT function switch which, because of the design, offers no positive indication to the operator of a selection to the ON position. Accordingly, the CASB recommends that:

> The Department of Transport amend the approval specifications for emergency locator transmitters (ELT) to include a function switch which allows confirmation of selection to the ON position in conditions of little or no light, or in circumstances in which the pilot's vision has been impaired as a result of the accident.
>
> (CASB 86-22)

4.2.4 Company Management Organization

To ensure that routine decision-making in a company is influenced by expertise in the different elements of the operation, and that the responsibility for decisions is borne by qualified individuals, the Department of Transport approves the company organizational structure in accordance with the ANOs and Air Carrier Inspector Manuals.

In small companies of few aircraft, the Department of Transport may approve the candidature of one suitably qualified individual to more than one management position, thereby adjusting the organizational structure to accommodate the less complex demands of relatively simple operations. While the CASB understands the economic necessity for this practice, the Board is concerned that safety may be jeopardized when a small operation with a reduced organizational structure expands in complexity beyond the capacity of the approved management structure.

In the case of the accident company, the operations had expanded to include medical evacuations, specific point passenger-carrying service, and flight training. The company operated 12 aircraft, and employed 14 pilots and a number of aircraft maintenance engineers (AMEs) and apprentice AMEs. Nonetheless, three of four company management positions were held by a single individual. Unsafe company operating practices, the lack of communications between employees and management, and the work-related pressures experienced by employees of the company were symptoms of an organizational structure that lacked sufficient managerial checks and balances to preserve safety. TC officials, while aware of the degradation of the company work environment, did not influence change in the management structure. Of note, following the accident TC required that the responsibilities for chief pilot and chief maintenance engineer be divided between two individuals. However, it is the Board's view that, at present, there are insufficient guidelines for TC officials to evaluate the safety effectiveness of a company's management structure as company operations expand in complexity.

Accordingly, the CASB recommends that:

> The Department of Transport establish safety guidelines, commensurate with the complexity of the company's operation, which will permit officials to evaluate the effectiveness of a company's organizational structure.

(CASB-86-23)

4.3 Other Safety Concerns

4.3.1 Pilot Decision-Making

The Board is concerned that the pilot of the accident aircraft knowingly descended to an unsafe altitude while in instrument meteorological conditions. Such pilot decision-making regarding en route weather conditions is frequently contributory to aviation accidents in Canada. Based upon a program developed in cooperation with other nations, TC plans to implement a training program for pilot decision-making for candidates for private and commercial licences beginning in July 1987. The Board will continue to monitor the contributory human factors in occurrences involving pilot decision-making.

4.3.2 Aircraft Operating Beyond Weight and Balance Limitations

The disregard for safety whereby pilots continue to operate aircraft in excess of the maximum allowable weight limitation and with baggage inadequately stowed for flight is cause for ongoing concern within the CASB. The concern is shared by the Department of Transport, which has recently undertaken a national aviation safety campaign to publicize the hazards of operating aircraft beyond weight and balance limitations. The Board has issued three recommendations pertaining to this matter (CASB 85-01, 85-02, and CASB 85-25), and a study of weight- and balance-related accidents in small commercial operations is near completion. Further recommendations on this issue may be forthcoming.

SABOURIN LAKE AIRWAYS
CESSNA A185F C-GLJC
RED LAKE, ONTARIO 45 mi ENE
16 NOVEMBER 1984

REPORT NUMBER: 84-C40089 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	13,000	1,400
LAST 90 DAYS	240	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

While on a routine flight from Red Lake to Cat Lake, the pilot of the wheel/ski-equipped aeroplane was informed that a helicopter had made a forced landing on the east shore of Lost Bay because of contaminated fuel. Prior to departure from Cat Lake, the pilot loaded extra fuel for the downed helicopter. The helicopter pilot had checked the thickness of the ice and reported by radio that the ice was four and one-half inches thick. The rescue pilot landed safely, but when he taxied close to shore, the left wheel/ski broke through the ice followed by the right wheel/ski.

The ice nearer the shore was not as thick as the ice further out where the helicopter pilot had completed the check. As a result, it was not capable of supporting the weight of the aircraft.

FINDINGS:

Cause Related:

1. The ice surface was not thick enough to support the weight of the aircraft.

Other:

- Nil -

06/06/86

PIKANGIKUM AIR SERVICES LTD.
CESSNA A185F C-GEHJ
DEER LAKE, ONTARIO
09 DECEMBER 1984

REPORT NUMBER: 84-C40092 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1000 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,831	723
LAST 90 DAYS	137	137

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot overflew the intended landing area at 800 feet above ground level to check for obstructions and then landed the ski-equipped aircraft parallel to the shoreline on the snow-covered lake. The aircraft had travelled about 70 feet, when the skis struck an unmarked reef hidden under snow. The aircraft bounced into the air, touched down, and slid to a stop 350 feet beyond the reef. Damage occurred to the right gear leg, gear box, ski assembly, and wing tip fairing.

Prior to departure, the pilot was instructed to use the area for landing, as the ice conditions were considered to be suitable.

The pilot estimated weather conditions at the time of occurrence to be 3,500 feet overcast, visibility five miles, and wind calm.

The investigation revealed that the unmarked reef could not be detected from the air because of the snow cover and the overcast sky condition. Normally aircraft take off and land farther away from the shoreline where natural obstructions are not a problem; however, the condition of the ice toward the centre of the lake was uncertain.

.../2

DATE: 02/10/86

FINDINGS:

Cause Related:

1. The landing was made parallel to the shoreline due to uncertain ice conditions toward the centre of the lake.
2. The aircraft struck an unmarked reef on the landing roll.
3. The reef could not be detected from the air because of the snow cover and overcast sky conditions.

Other:

--Nil--

BATTLEFORD AIRWAYS
CESSNA 172 C-GDIH
BEAUVAL, SASKATCHEWAN
20 DECEMBER 1984

REPORT NUMBER: 84-C40073 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1120 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,600	251
LAST 90 DAYS	60	38

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft departed North Battleford, Saskatchewan, on a visual flight rules (VFR) flight to Buffalo Narrows, Saskatchewan. Approaching Buffalo Narrows, the pilot encountered freezing rain and was forced to turn back. Forward visibility was drastically reduced as ice had accumulated on the windscreen and the pilot was unable to clear it away. The pilot decided to follow a highway with the intention of landing at the first airport outside the precipitation area. During the final approach at Beauval Airport, the aircraft stalled during the flare and landed hard on the runway. There was substantial damage to the right landing gear as a result of the hard landing.

Prior to departing North Battleford, the pilot received a thorough weather briefing. The area forecast applicable for the flight did not contain any information regarding freezing rain, nor was there evidence of freezing rain present in any of the actual weather reports in the area.

The pilot felt that he had fulfilled all of the requirements in planning a successful flight. Despite this, he found himself in a difficult situation when he encountered unforecast freezing rain, and because of the reduced forward visibility, he misjudged the flare in landing.

.../2

06/06/86

FINDINGS:

Cause Related:

1. The pilot encountered freezing rain which was not forecast.
2. Ice accumulated on the windscreen, and as a result, forward visibility was reduced.
3. Because of the reduced forward visibility, the pilot misjudged the flare and stalled the aircraft which resulted in a hard landing.

Other:

- Nil -

06/06/86

ELLAIR LTD.
PIPER PA-34-200T C-GMSF
THOMPSON, MANITOBA
8 MAY 1984

REPORT NUMBER: 84-C44017 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1510 CST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,479	345
LAST 90 DAYS	286	190

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

On approach to the airport, the landing gear was selected down, and the nose gear indicated unsafe. A missed approach was carried out, and the landing gear was selected up. The aircraft was flown to a practice area where the crew attempted to obtain a down-and-locked indication for the nose gear. When these attempts failed, the aircraft was returned to the airport. After flying past the tower, the crew was informed by tower personnel that the gear appeared to be in the down position, and the crew decided to land the aircraft. The aircraft touched down safely, and both engines were shut down. As the gear did not retract during the landing roll, the crew restarted the engines and taxied to the company hangar. As the aircraft was slowed in front of the hangar, the nosewheel collapsed.

An examination of the nose gear assembly revealed that a bolt had failed from fatigue, thus preventing the nose gear from locking in the down position.

FINDINGS:

Cause Related:

1. Following a safe landing, the pilot elected to taxi the aircraft with an unsafe nose gear indication.

2. A bolt within the nose gear assembly failed from fatigue, thus preventing the nose gear from locking in the down position.

.../2

02/10/86

Other:

- Nil -

SAFETY ACTION:

Action Taken:

Transport Canada has included an article in General Aviation Inspection Aids informing PA-34 owners of this bolt failure.

02/10/86

This occurrence was investigated initially by the Aviation Safety Bureau of Transport Canada. The continued investigation and review were conducted jointly by the Aircraft Accident Review Board and the Canadian Aviation Safety Board. The purpose of the investigation is to advance aviation safety not to determine or apportion any blame or liability.

AIRCRAFT ACCIDENT REPORT

CESSNA 150F, C-GNKA and
PIPER LANCE, C-GSXF
HAMILTON CIVIC AIRPORT, ONTARIO
21 JUNE 1984

REPORT NUMBERS 84-040803, 84-040804

SYNOPSIS

At the Hamilton Civic Airport, a Cessna 150 with one pilot on board, completed a touch-and-go landing on runway 12 and climbed to circuit height. In the meantime, a Piper Lance with an instructor and a student on board was cleared to minimums on a simulated instrument approach to runway 06. The Piper Lance completed the simulated instrument approach and continued with an overshoot and a climb on the runway heading. The Cessna 150 which was then on a left downwind leg for runway 12, and the Piper Lance which was still climbing, collided. The left main gear of the Cessna 150 was torn from the aircraft when it penetrated the cockpit of the Piper Lance.

When the Cessna's left main gear entered the cockpit of the Piper Lance, it struck and fatally injured the student. The instructor then assumed control and made a steep right descending turn to land on a field. On short final to the field, the landing gear of the Piper Lance contacted hydroelectric wires. As the aircraft touched down, it yawed left and slid sideways prior to stopping. After the collision, the Cessna 150, with serious control problems, circled the airport for 35 minutes before landing on the grass parallel to runway 12. On touchdown, the damaged nosewheel dug into the soft ground causing the aircraft to nose over.

Ce rapport est également disponible en français.

18 December 1985

3.0 CONCLUSIONS

3.1 Cause-Related Findings:

1. The air traffic controllers did not alert either the pilot of the Cessna 150 or the pilot of the Piper Lance of a possible conflict between the aircraft.
2. The pilots-in-command of the Cessna 150 and the Piper Lance did not see each other as their aircraft converged and the aircraft collided in mid-air.
3. The Cessna 150 pilot thought that the air traffic control instruction to the Beechcraft Baron to remain low during the overshoot was meant for the Piper Lance.

3.2 Other Findings:

1. The pilot of the Piper Lance, although seriously injured, managed to carry out a forced landing in a field.
2. The pilot of the Cessna 150, faced with serious control problems, decided, on the advice of the tower, to wait until the emergency vehicles were in place before landing.
3. The pilots of the Piper Lance and the Cessna 150 were certified and qualified for the flight in accordance with regulations.
4. The aircraft were certified, equipped, and maintained in accordance with regulations and approved procedures.
5. There was no evidence of any airframe failure or system malfunction prior to or during the flight in either aircraft.
6. The weights and centres of gravity of both aircraft were within the prescribed limits.

4.0 RECOMMENDATIONS

4.1 Action Taken

No urgent safety actions or interim recommendations were initiated by the Canadian Aviation Safety Board.

4.2 Further Action Required

The Canadian Aviation Safety Board considers that this was a preventable accident; it could have been avoided if the pilots had been aware of each other's position and intentions. Situational awareness would have been maintained if either the pilots had employed the "see and avoid concept" or Air Traffic Services (ATS) had issued an advisory.

In this case, the degradation of both pilots' awareness can be attributed to the following factors: complacency because they were flying in a control zone; distraction due to instructional duties; misinterpretation of clearances given to another aircraft; and the absence of a timely traffic advisory by the tower controller.

The Board is satisfied that this accident did not result from deficiencies in the regulations or procedures applicable to operations at Hamilton Civic Airport. However, in view of the cause-related findings of this investigation, the Board recommends that:

> The Department of Transport disseminate the circumstances of this mid-air collision through their accident prevention program to urge pilots and controllers to adhere to the recommended practices and procedures for operations at controlled airports.
>
> CASB 85-34

LAKEHEAD FLYING SCHOOL LTD.
CESSNA 172N C-GFEJ
MANITOUWADGE, ONTARIO
8 JULY 1984

REPORT NUMBER: 84-040037 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1500 EDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	21	21
LAST 90 DAYS	21	21

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was on his second solo flight and was practising touch-and-go landings. The surface wind was down the runway at five knots and the gravel surface of the runway was dry. The student had completed five touch-and-go landings. During roll-out on the sixth landing, with the power at idle, the aircraft veered to the left. The pilot attempted to correct using right rudder and then right brake but was unsuccessful. The aircraft left the runway just beyond the mid-point and came to rest in a ditch.

The student inadvertently applied a control input during the landing roll, causing the aircraft to veer left. The corrective action taken by the student was either too late or of insufficient magnitude to re-establish directional control.

FINDINGS:

Cause Related:

1. The student pilot inadvertently allowed the aircraft to veer to the left during the landing roll.

2. The corrective action taken by the pilot was insufficient to prevent the aircraft from leaving the side of the runway.

Other:

- Nil -

08/10/86

TORONTO AIRWAYS LIMITED
CESSNA 150L C GOZB
BUTTONVILLE AIRPORT, ONTARIO
19 JULY 1984

REPORT NUMBER: 84-040042 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0825 EDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	20	20
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As he rotated for lift-off while practising short field cross-wind take-offs, the student pilot lost directional control and decided to abort the take-off. The aircraft veered to the left off the runway and, despite full brake application, continued until it hit a ditch.

The pilot's control inputs were ineffective to maintain directional control during rotation in the crosswind. Investigation found that when the pilot decided to abort the take-off and apply brake, the throttle had been left in the full open position. This would account for the difficulty in stopping the aircraft prior to hitting the ditch.

FINDINGS:

Cause Related

1. Directional control was lost during take-off.
2. The throttle was left in the full open position while attempts were made to stop the aircraft.

Other

- Nil-

19/10/85

ST. AIR LTD.
CESSNA 182 C-GBAE
FISHING LAKE, MANITOBA
15 SEPTEMBER 1984

REPORT NUMBER: 84-C40080 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1250 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	620	10
LAST 90 DAYS	30	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During a solo training flight to obtain a float endorsement, the pilot was on final approach to land on a lake, heading 45 degrees to the direction of the wind. The wind was gusting to about 20 knots. He was unable to keep the aircraft straight and lost control on landing when the right float dug into the water. The aircraft rolled right and turned over.

Although there was adequate distance available to land directly into the wind, the pilot landed with a 45-degree cross-wind from the left. The pilot had limited experience and training on float-equipped aircraft. This is considered a factor in the choice of the landing direction and the inability to compensate for the wind conditions on landing.

FINDINGS:

Cause Related:

1. The pilot was inexperienced on float-equipped aircraft.
2. The landing was not carried out directly into the wind.
3. Adequate compensation for the cross-wind was not made on landing.

Other:

-- Nil --

21/11/85

TORONTO AIRWAYS LIMITED
CESSNA 150M C-GEIE
BUTTONVILLE AIRPORT, ONTARIO
17 SEPTEMBER 1984

REPORT NUMBER: 84-040064 (Accident)
LOCAL TIME: 0950 EDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	46	46
LAST 90 DAYS	36	36

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft, which was on a very steep final approach, touched down hard with a high rate of descent and bounced. After touching down a second time, the aircraft began to porpoise, and the nose gear collapsed. The nose dropped, and the propeller struck the runway. The aircraft skidded to a stop and came to rest on the main gear and nose cowling.

It was determined that the student pilot had rounded out too low to effectively reduce the rate of descent, and as a result, the aircraft landed hard and bounced. As the student was unable to control the subsequent porpoising, the aircraft struck the runway in a nose-down attitude which caused the nose gear to collapse. The pilot's experience was 13 hours solo and 23 hours dual flight time.

FINDINGS:

Cause Related:

1. The aircraft bounced on landing as the result of a high rate of descent during a steep approach.

2. The student pilot's control inputs were ineffective in recovering from the bounce landing.

3. The aircraft porpoised down the runway.

4. The nose gear collapsed.

Other:

-- Nil --

DATE: 19/03/86

LOYAL-AIR LTD
PIPER-28-140 C-GNWO
KINGSTON AIRPORT, KINGSTON, ONTARIO
20 OCTOBER 1984

REPORT NUMBER: 84-044079 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1549 EDT
OPERATION: Specialty Flying Training
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	650	Not Available
LAST 90 DAYS	Not Available	Not Available

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was on a cross-country flight with an en-route stop at Kingston. Immediately after touchdown at Kingston, the aircraft began to swerve. The aircraft was brought to a stop on the runway without further incident. A visual inspection revealed that the upper torque link had broken away from the right main landing gear cylinder.

Investigation revealed that both the inboard and outboard "ears" of the attachment point (where the upper torque link is joined to the main cylinder) had broken off the cylinder. The inner ear showed signs of fatigue; when complete fatigue failure of the ear occurred on landing, a force was exerted on the outer ear causing it to fail from instantaneous overload.

This aircraft is based at an aerodrome which has a turf runway. Landing on this type of surface subjects the landing gear components to higher stresses than those experienced on hard-surfaced runways, thereby increasing the rate of accumulation of fatigue damage due to repeated landings.

.../2

26/06/86

FINDINGS:

Cause Related:

1. The inner ear on the right main gear cylinder failed due to fatigue.
2. The outer ear failed from instantaneous overload.
3. Routine operations from a turf runway had subjected the landing gear to stresses higher than those experienced on hard-surfaced runways.

Other:

- Nil -

26/06/86

TRENTON FLYING CLUB
CESSNA 150M C-GOYD
CANADIAN FORCES BASE TRENTON, TRENTON, ONTARIO
24 JANUARY 1985

REPORT NUMBER: 85-050002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1301 EST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	25	25
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

A student pilot was authorized to conduct a solo flight for the purpose of circuit training. Ground control issued taxi instructions which required the pilot to make a left turn on the taxiway after leaving the flying club ramp. The student turned right instead of left when he exited the ramp. The aircraft passed behind a Hercules transport plane that was conducting a high power run-up. Prop wash from the transport blew the small aircraft over. The Cessna came to rest in an inverted position off the edge of the taxiway.

Taxi clearance was via a route that was not the normal route expected by the student pilot. When run-ups are in progress the normal is not followed. The route issued by ground control would have kept the student clear of the Hercules. From his seating position in the tower, the ground controller is unable to see certain parts of the taxiways and did not notice the student going the wrong way. The tower controller noticed the aircraft was on the wrong taxiway just as it was about to pass behind the Hercules. He alerted the ground controller to the dangerous situation and told the ground controller to tell the student to stop. The ground controller transmitted on the wrong frequency. He realized his error, but by the time the Hercules had been directed by the tower controller to reduce its power, the small aircraft was being blown over.

The ground crew that was conducting the run-up of the Hercules had a ground look-out man positioned in front of the aircraft. He advised the cockpit run-up crew that a small aircraft was passing behind the Hercules. The crew replied that they had not been instructed by the tower to reduce power yet. By the time the instruction came from the tower it was too late; the small aircraft was blown over by the propwash.

... /2

18/03/86

FINDINGS:

Cause Related:

1. The taxi instructions were misunderstood by the student pilot.

2. The proper taxi route was not followed.

3. The incorrect taxi route was not noticed by Air Traffic Control until the small aircraft was nearly behind a Hercules conducting a high power ground run.

4. When the aircraft was noticed on the wrong taxiway, it did not receive a timely warning because the warning was transmitted on the wrong frequency.

5. Although the run-up crew was aware of the presence of the small aircraft, the power on the Hercules' engines was not reduced.

Other:

-- Nil --

18/03/86

HARV'S AIR SERVICE LTD
CESSNA 152 C-GGPE
STEINBACH, MANITOBA
16 FEBRUARY 1985

REPORT NUMBER: 85-C50011 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0845 CST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	56	56
LAST 90 DAYS	.3	.3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Following two satisfactory circuits with an instructor, the pilot was authorized to fly solo circuits. As the aircraft accelerated on the first solo circuit, it began to veer to the left. The pilot increased the input of right rudder, but the aircraft continued to travel toward the left side of the runway. The pilot closed the throttle in an attempt to stop, but the aircraft left the runway, rolled across 20 feet of cleared area, and collided with a snowbank. The aircraft sustained damage to the nosewheel, propeller, and the outboard section of the left wing.

Examination of the aircraft revealed no pre-occurrence discrepancy or failure. The investigation did reveal that the pilot had not flown for several months, and that during the take-off roll, he had not made use of all the right rudder available. It was also learned that during the dual circuits, the instructor had suggested that the pilot use more right rudder during the take-off roll.

The evidence suggests that the pilot did not sufficiently compensate for torque effect during the take-off roll, and as a result, directional control was lost.

.../2

06/06/86

FINDINGS:

Cause Related:

1. Rudder control input was insufficient to compensate for the effects of torque and the aircraft left the runway.
2. The aircraft struck a snowbank near the runway.
3. The relatively inexperienced pilot had not flown for several months.

Other:

- Nil -

06/06/86

WINDSOR FLYING CLUB
PIPER PA38-112 C-GRQC
WINDSOR AIRPORT, ONTARIO
16 FEBRUARY 1985

REPORT NUMBER: 85-050007 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1300 EST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

	PILOT		CO-PILOT	
PILOT HOURS:	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	1,142	800	28	28
LAST 90 DAYS	120	100	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was taxiing on the ramp after a dual training flight. The instructor, who was at the controls, commenced a left turn near the edge of the ramp to park the aircraft. As the turn progressed, the aircraft slid into a snowbank bordering the ramp, damaging the right wing.

The ramp area had patches of ice and snow which reduced traction for taxiing aircraft, and the aircraft was taxiing at a slightly higher than normal taxi speed. The instructor attempted a turn on a patch of ice, and the aircraft slid into the high snowbank.

FINDINGS:

Cause Related:

1. The ramp area had patches of ice and snow which reduced traction.
2. The aircraft was taxiing too fast for the slippery conditions.
3. The ramp area was bordered by high snowbanks.
4. A turn was attempted on a patch of ice, causing the aircraft to slide into a snowbank.

Other:

-Nil-

06/08/86

CESSNA 152 C-GZJC
KIRKPATRICK LAKE, ONTARIO 1 mi SW
29 OCTOBER 1985

REPORT NUMBER: 85-050087 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1520 EST
OPERATION: Flying Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	110	33
LAST 90 DAYS	12	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was on a solo cross-country training flight, when the aircraft engine (Lycoming 0-235-L2C) stopped. The pilot force-landed the aircraft in a clearing in the hilly treed countryside. During the landing roll, the aircraft struck obstructions and nosed over.

Examination of the aircraft engine revealed that the number four cylinder exhaust valve had failed and that the head of the valve had entered the cylinder, resulting in damage to the top of the piston and the intake valve seat. The mode of failure of the exhaust valve could not be determined.

FINDINGS:

Cause Related:

1. The aircraft engine stopped when the exhaust valve failed and the head of the valve entered the cylinder.

Other:

- Nil -

03/10/86

AG AIR LTD.
CESSNA A-188, C-FKUH
ROLLA, BRITISH COLUMBIA
28 JUNE 1983

REPORT NUMBER: 83-W30028 (Accident)
LOCAL TIME: 0900 PDT
OPERATION: Specialty Aerial Application
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11800	800
LAST 90 DAYS	125	125

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The strip used for the take-off was 2350 ft long, soft-surfaced and covered with vegetation averaging 10 inches in height. The southwest end was bordered at right angles by a road and a small gully; general terrain elevation on either side of the gully was 2500 ft ASL. At the time of the occurrence the temperature was 18 degrees C and a 5 to 10 kt wind was blowing from the southwest.

As the spray plane neared the end of the strip, the pilot believed that lift-off speed was attained. The aircraft broke ground, but suddenly sank below 2500 ft indicated when it crossed the edge of the gully. Realizing that a collision with rising ground ahead was inevitable, the pilot pitched the nose up in an attempt to cushion the impact. Both main landing gear struck the incline and were torn free. The aircraft slid uphill on a soft canola field, decelerating rapidly.

There was marginal room for lift-off under existing weather and strip conditions. As the aircraft crossed a downslope shortly after breaking ground, it flew out of ground effect. The resultant loss of lift may have been aggravated by the airflow over the gully.

The aircraft manufacturer's Pilot Handbook provides take-off performance data only for hard surface runways under standard atmospheric conditions, thus making it difficult to accurately assess the take-off distance required for non-standard situations.

.../2

19/09/85

FINDINGS:

Cause Related

1. The airstrip was marginally adequate for take-off based on the runway and weather conditions.

2. Loss of lift was experienced when the aircraft flew out of ground effect and, possibly, into subsiding air.

3. Insufficient information was available to the pilot to accurately assess the suitability of the strip.

Other

-- Nil --

19/09/85

CALGARY FLIGHT TRAINING CENTRE
CESSNA 152, C-GMUH
SPRINGBANK AIRPORT, ALBERTA, 3/4 MI SE
27 JULY 1984

REPORT NUMBER: 83-W30035 (Accident)
LOCAL TIME: 2111 MDT
OPERATION: Specialty Recreation
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	400	6
LAST 90 DAYS	25	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot rented the aircraft for a local flight. On return to the airport the engine began to run rough and then stopped. The aircraft was unable to reach a runway and a forced landing was carried out in a plowed field. During landing the aircraft nosed over and came to rest inverted.

The engine had stopped because of fuel exhaustion. Post accident draining of the fuel tanks revealed that they contained less than the manufacturer's specified unusable fuel.

It was reported that during the pre-flight checks, the fuel gauges showed 1/4 full on one tank and 1/3 full on the other. The tanks were not dipped to verify the gauges. It was planned that the flight would last only 30 minutes and it was felt that sufficient fuel was on board for the intended flight. The accident occurred 1 hour and 7 minutes after take-off.

.../2

DATE: 9/05/85

FINDINGS:

Cause Related

1. The aircraft did not contain sufficient fuel for the flight.
2. The engine stopped due to fuel exhaustion.
3. The forced landing resulted in the aircraft nosing over because of the plowed terrain.

Other

-- Nil --

AMERICAN TRANS AIR
BOEING 707/323C N7597A
GANDER, NEWFOUNDLAND 400 mi E
07 MARCH 1984

REPORT NUMBER: 84-A44901 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0710 NST
OPERATION: International Charter
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11,500	2,000
LAST 90 DAYS	150	150

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	3
PASSENGERS	-	-	4

SUMMARY REPORT:

The ferry flight was enroute from Gatwick, England to Boston, Massachusetts with only the flight crew and cabin attendants aboard.

While the aircraft was cruising at flight level 390, an unusual vibration was felt in the aircraft. All engine parameters indicated a loss of power on the number four engine (Pratt & Whitney JJ3D-7B). When the First Officer looked outside, he saw the number four engine intake cowling separate from the engine and fly up and over the leading edge of the wing.

The Captain declared an emergency and the aircraft made an unscheduled three engine approach and landing at Gander Airport.

As the Aviation Safety Bureau did not have a mandate to delay this U.S. Registered aircraft for an investigation, it was agreed that the Federal Aviation Administration (FAA) would provide the information concerning this incident.

An examination of the engine revealed that failure of one of the second stage fan blades caused the excessive vibrations and the loss of power. The vibrations, in turn, caused the failure of several attaching bolts at the nose cowl attach flange. As a result, the complete nose cowl assembly separated from the engine. The examination did not determine why the fan blade failed. Approximately two months after the incident the engine was scrapped and unavailable for further investigation.

19/09/85

FINDINGS:

Cause Related

1. The number four engine lost power when one of the second stage fan blades failed.

2. Failure of the second stage fan blade set up excessive vibrations which caused several attaching bolts at the nose cowl attach flange to fail.

3. The failure of the attaching bolts caused the nose cowl assembly to separate from the engine.

Other

1. Neither the FAA nor the operator determined why the fan blade failed.

19/09/85

FLIGHT CENTRE VICTORIA
PIPER PA 31 C-GZTD
VANCOUVER INTERNATIONAL AIRPORT, BRITISH COLUMBIA
11 MAY 1984

REPORT NUMBER: 84-P40015 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2020 PDT
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,900	2,650
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft, which was taxiing in after the completion of a cross-country flight, approached an area on the apron designated as a vehicle-crossing point. The pilot suddenly noticed an automobile crossing the apron on his left side. He applied brakes but was unable to stop in time, and the aircraft and car collided.

The driver had stopped at a stop sign prior to crossing the apron but did not notice the aircraft because it was obscured by the setting sun.

FINDINGS:

Cause-Related:

1. The driver of the vehicle did not notice the approaching aircraft.

2. The pilot did not observe the car crossing the apron until it was too late to avoid a collision.

Other:

- Nil -

06/06/86

INTERLAKE AIR
CESSNA A188B C-GQDL
POPLAR POINT, MANITOBA 4 mi W
27 JUNE 1984

REPORT NUMBER: 84-C40040 (Accident)
LOCAL TIME: 2015 CDT
OPERATION: Specialty Aerial Application & Distribution
DAMAGE: Substanial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,000	120
LAST 90 DAYS	70	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft took off from an 1800-foot turf airstrip. During the climb the aircraft failed to clear a 50-foot power line about 3,000 ft from the end of the runway. After striking the wire the aircraft hit the ground in a nose-down attitude and then flipped over on to its back.

The temperature was 27 degrees celsius and the headwind component was about 7 kt. No evidence of engine problems was found. The high temperature would have increased the required take-off length, but a previous take-off from the same runway at a slightly heavier weight had been successful. The reason for the aircraft's failure to clear the wires was not determined.

The aircraft manufacturer's Pilot Handbook provides take-off performance data only for hard surface runways under standard atmospheric conditions, thus making it difficult to accurately assess take-off distance required for non-standard situations.

FINDINGS:

Cause Related:

1. The reason for the aircraft's failure to clear the wires was not determined.

Other:

1. Insufficient aircraft performance data was available to the pilot to accurately assess the suitability of the airstrip.

DATE: 19/09/85

FISHING FAMILY LAKE AIR SERVICE LTD.
CESSNA 180B C-GGOJ
LITTLE GRAND RAPIDS, MANITOBA
05 JULY 1984

REPORT NUMBER: 84-C40043 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1211 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	208	7
LAST 90 DAYS	20	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was on a visual flight rules (VFR) flight from St. Andrews, Manitoba to Little Grand Rapids, Manitoba with a cargo of automotive fuel. The flight was uneventful until the landing when the left main gear collapsed. The aircraft then travelled about 100 feet and came to rest on the left wing tip at the edge of the runway. The left gear leg had pulled away from the fuselage attachment box.

The main gear attach bolt was found on the runway and was forwarded for laboratory examination. The bolt had been bent and there was metal trapped between the threads. The direction of the deformation and smearing on the entrapped material was consistent with the bolt being pulled from its point of attachment by bending. Most of the entrapped material was from the bolt thread surfaces. The locknut was not found at the scene, therefore it is not known if a locknut had been installed on the gear attach bolt.

According to the evidence the locknut was missing at the time of the landing, and as the weight of the aircraft was placed on the landing gear, the bolt was pulled from its attachment point.

The following laboratory report was completed: LP 253/84 - Main Landing Gear Bolt Smears.

FINDINGS:

Cause Related:

1. The left gear collapsed when the gear attach bolt was pulled from its attachment point because a locknut was missing.

2. The reason for the missing locknut was not determined.

Other:

- Nil -

06/06/86

LONDON FLYING CLUB OF CANADA
PIPER PA28-181, C-GQFQ
BARRIE, ONTARIO
17 JULY 1984

REPORT NUMBER: 84-040040 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0755 EDT
OPERATION: Flying Club Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	133	133
LAST 90 DAYS	22	22

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

In preparation for a landing, the pilot overflew the short grass airstrip in order to check the wind direction and the runway condition. During the landing, the aircraft bounced once and then settled back onto the runway. The pilot applied the brakes; however, they had little effect on aircraft deceleration. The aircraft skidded off the end of the runway and through a ditch. The nosewheel collapsed, and the aircraft came to rest on its nose.

The grass runway was covered with a heavy dew which reduced braking effectiveness. The pilot may not have considered the possibility of dew forming on the grass airstrip and its effect on braking action.

FINDINGS:

Cause Related:

1. Braking action was poor on the wet grass runway.

Other:

- Nil -

03/10/86

The Canadian Aviation Safety Board investigated this occurrence for the purpose of advancing aviation safety. It is not the object of the Board to determine or apportion any blame or liability.

AVIATION OCCURRENCE REPORT

LABRADOR AIRWAYS LTD.
DE HAVILLAND OF CANADA
DHC-6-100 C-FAUS
GOOSE BAY, LABRADOR, NEWFOUNDLAND
11 OCTOBER 1984

REPORT NUMBER 84-H40005

SYNOPSIS

The aircraft was flying VFR from St. Anthony, Newfoundland to Goose Bay, Labrador on the return flight from a MEDEVAC. While flying in deteriorating weather in the Mealy Mountain area, the aircraft struck a rock outcropping near the top of a mountain. After the initial impact, the aircraft broke up and burned. All four occupants sustained fatal injuries.

The Canadian Aviation Safety Board determined that the flight was attempted in mountainous terrain in marginal weather conditions. The aircraft was flown at an altitude which did not provide terrain clearance, and the aircraft struck a mountain for undetermined reasons.

Ce rapport est également disponible en français.

31 July 1986

3.0 CONCLUSIONS

3.1 Cause-Related Findings:

1. A VFR flight was attempted in mountainous terrain in marginal weather conditions.
2. The aircraft was flown at an altitude which did not provide terrain clearance, and the aircraft struck a mountainside for undetermined reasons.

3.2 Other Findings:

1. The self-dispatch system of the type employed by the operator was approved by Transport Canada. This system permitted the total delegation of flight authorization to the pilot, thereby eliminating the involvement of flight operations management in operational decisions.
2. The flight following and Search and Rescue alerting procedures employed by the operator resulted in a delay in advising Search and Rescue of the overdue aircraft.
3. The lapsed instrument rating held by the co-pilot did not allow the crew to legally file an IFR flight plan.
4. The flight crew was certified and qualified for the flight in accordance with existing regulations.
5. The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures.
6. There was no evidence found of any airframe failure or system malfunction prior to or during the flight.
7. The weight and centre of gravity were calculated to be within the prescribed limits.

4.0 RECOMMENDATIONS

4.1 Action Taken

No urgent safety action or interim recommendations were initiated by the Canadian Aviation Safety Board (CASB) as a consequence of this accident.

4.2 Action Required

4.2.1 Company Operations Manual - Missing Aircraft Procedures

The CASB believes that because company Operations Manuals are not required to specify procedures for company personnel to notify authorities when aircraft operating on a flight itinerary are overdue, a safety deficiency exists. If the deficiency is not attended to, unnecessary delays in activating search operations will continue to threaten the lives of survivors.

The company Operations Manual is the principal method by which guidance on the conduct of an operation is specified to company personnel. All company Operations Manuals must, as a minimum, contain specific items which are listed in Schedule B of Air Navigation Order Series VII, Numbers 2, 3 and 6. Examples of required items include emergency flight procedures, emergency duties, and procedures for accident notification.

The lack of guidance to company personnel for the notification of authorities in the event of an overdue aircraft has been identified as a safety deficiency in other accident investigations (refer to report numbers 81-A10002 and 84-A40010). Accordingly, the CASB recommends that:

> The Department of Transport amend Schedule B of ANO Series VII, Numbers 2, 3 and 6 to require that company Operations Manuals contain procedures to company personnel for the timely notification of missing aircraft to the appropriate authorities.

(CASB-86-08)

4.2.2 Flight Planning Provisions for Search and Rescue (SAR) Alerting

Under normal circumstances, when an aircraft is operating on a Flight Note or a Flight Itinerary, no Search and Rescue (SAR) action is initiated until 24 hours have elapsed from the expected time of arrival. The differing SAR alerting provisions for a Flight Note and Flight Itinerary, in contrast with those for a Flight Plan, are premised on the difficulties that pilots encounter in reporting a safe arrival in remote regions. The Board recognizes the need for flexibility in flight planning; however, the inappropriate use of a Flight Itinerary or a Flight Note results in delays to the expedient commencement of a search and is considered to be a safety deficiency.

The accident aircraft was on a charter flight from and to airports which were serviced by Flight Service Stations. There was no foreseeable difficulty in reporting a safe arrival and consequently, the 24 hour SAR alert delay associated with a Flight Itinerary was unnecessary. The Board believes that commercial operations should be conducted with minimal delays in SAR alerts in the event of a mishap.

A pilot may indicate on a Flight Note (or to a responsible person when using a Flight Itinerary) a SAR alert time of less than 24 hours, providing the flexibility of a Flight Note or Itinerary while tailoring the SAR alert provision to the requirements of a specific flight. This information is contained in the Department of Transport Aeronautical Information Publication (A.I.P. Canada) TP 2300 E; nonetheless, the Board believes that this provision for SAR alerts should be highlighted. Accordingly, the CASB recommends that:

> The Department of Transport require that Company Operations Manuals specify the maximum use of available communications systems in flight planning so as to minimize SAR alerting delays in the event of mishap; and
>
> (CASB-86-09)
>
> The Department of Transport, through its promotional programs, encourage the use whenever feasible of SAR alert times of less than 24 hours when operating on a Flight Notification or Flight Itinerary
>
> (CASB-86-10)

4.3 Other Safety Concerns

4.3.1 Operational Control

The CASB notes with continued concern that an absence of management checks permitted the accident flight to be conducted without effective management control. In 1985, as a consequence of an accident at Fort Franklin which claimed the lives of nine persons, the CASB issued Recommendation 85-07 pertaining to the effectiveness of commercial flight authorization requirements. While the Minister of Transport concurred with the intent of this recommendation, he felt that adequate control mechanisms to safeguard the safety of commercial operations existed.

The Board recognizes the fine differentiation between regulations which protect the safety of an operation and cumbersome procedures which hinder efficient operations. Notwithstanding, the CASB persists in the belief that a well-defined flight authorization process which provides, whenever practicable, an effective check by a person other than the flight crew on the adequacies of the pre-flight preparations is essential. The Board will further analyze this issue in light of current investigations, and formal recommendations may be forthcoming.

4.3.2 Human Factors

The aircraft struck a mountain for undetermined reasons. It has nonetheless been established that an experienced crew continued VFR flight in marginal weather conditions. To prevent similar accidents, there is a need to more fully understand the circumstances which adversely influence judgement in aviation decision-making. The Department of Transport has recently undertaken initiatives to research weaknesses in pilot decision-making skills. These include agreements to cooperate with and share research from other national agencies, to revise Canadian flight training requirements, and to develop safety promotional material to enhance decision-making skills. The Board supports these initiatives to prevent accidents related to in-flight decision-making.

C&M AIRWAYS
DE HAVILLAND DHC-2 C-GEZT
GRASSICK LAKE, SASKATCHEWAN
11 DECEMBER 1984

REPORT NUMBER: 84-C40094 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1230 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	15,000	1,500
LAST 90 DAYS	100	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ski-equipped aircraft landed normally on hard-packed snow; however, as the speed decreased, the aircraft veered left, departed the landing strip and contacted bordering trees.

The lubricant used on the steerable tail ski had congealed and did not allow the tail-ski locking pin to engage. This resulted in loss of aircraft directional control once below the speed at which the rudder was effective. The temperature at the time of occurrence was near minus 40 degrees Celsius.

A lighter lubricant was applied, and the steering mechanism operated normally.

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FINDINGS:

Cause Related:

1. The lubricant used on the tail-ski mechanism was not appropriate for cold-weather operations.

2. The tail-ski steering mechanism malfunctioned because of the congealed lubricant and prevented directional control of the aircraft on the ground.

Other:

- Nil -

17/09/86

ANNAPOLIS VALLEY FLYING SERVICES LTD.
PIPER LANCE PA32 C-GQJU
SAINT JOHN AIRPORT, NEW BRUNSWICK 4 mi NE
30 DECEMBER 1984

REPORT NUMBER: 84-A40026 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1348 ADT
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	150
LAST 90 DAYS	25	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

Approximately four minutes after taking off from Saint John Airport, the pilot reported to the Saint John tower that the aircraft engine had lost power. During the attempted forced landing, the aircraft struck tree-tops, flew between a set of wires that crossed a road and then hit a mailbox. The aircraft touched down on its wheels and rolled about 1,300 feet before coming to rest.

The investigation revealed that during the initial climb, the pilot intentionally switched to the right fuel tank to run it dry, even though the right fuel gauge was indicating empty; thirty seconds later the engine stopped. The pilot reselected the left tank, which was used for take-off, but he was unable to regain power in time and was therefore committed to a forced landing. An inspection of the fuel tanks after the accident revealed that the right tank was empty and that the left tank contained 20 gallons of fuel. When the engine was run off the left tank, it operated normally. The investigation concluded that the engine lost power because of fuel starvation.

.../2

06/08/86

FINDINGS:

Cause Related:

1. During the initial climb, the pilot selected an empty tank, causing the engine to stop.

2. The pilot changed the fuel selector position to a tank containing fuel, but the low altitude left insufficient time to restart the engine and he was committed to a forced landing.

3. During the forced landing, the aircraft struck trees and a mailbox.

Other:

-Nil-

06/08/86

NEWFOUNDLAND LABRADOR AIR TRANSPORT LTD.
DHC-2 C-GUBB
HARBOUR DEEP, NEWFOUNDLAND
04 JANUARY 1985

REPORT NUMBER: 85-A50001 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1435 NST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7000	1000
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The ski-equipped aircraft landed on the ice-covered bay. The ice was too thin, and the aircraft broke through and sank up to the wings.

The operator reported that the ice conditions had been inspected and a suitable landing area had been selected. However, the pilot landed on the other side of the bay where the ice had not been examined.

FINDINGS:

Cause Related

1. The aircraft landed on ice which was too thin to support the weight of the aircraft.

Other:

- Nil -

3/10/85

VOYAGEUR AIRWAYS LIMITED
PIPER PA31 CF-IGS
KIRKLAND LAKE AIRPORT, ONTARIO
05 MARCH 1985

REPORT NUMBER: 85-050012 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0800 EST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,600	625
LAST 90 DAYS	130	130

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was departing on the first leg of a charter flight with two crew members on board. After lift-off when the landing gear was selected up, the crew heard a loud bang. The landing gear was cycled and showed an in-transit light when up, and green gear-down-and-locked lights when down. The landing gear was extended and a landing completed. On roll-out, the right main landing gear collapsed, and the aircraft veered right into a snowbank bordering the runway.

The right-hand main landing gear link assembly (Part Number 40279-01) had fractured at the outboard pivot point. The link failed as a result of the overload extension of a fatigue-generated pre-crack. The cause of the pre-crack was not determined; however, the failure of this link was similar to the failure of a link of the same type documented in laboratory report LP 305/82 - Undercarriage Drag Link Cracking. The aircraft manufacturer has modified the design of the link to strengthen this component.

.../2

03/10/86

The following laboratory report was completed: LP 50/85 - Main Landing Gear Side Link Failure Analysis.

FINDINGS:

Cause Related:

1. The right-hand main landing gear link assembly fractured at the outboard pivot point.
2. The link failed as a result of fatigue, the cause of which could not be determined.
3. The design strength of the link was inadequate for the loads experienced.

Other:

1. The aircraft manufacturer has modified the design of the link to strengthen this component.

SAFETY ACTION:

Action Taken:

A Safety Advisory sent to Transport Canada has resulted in a Service Difficulty Alert (SDA 85-02) being issued to all Piper owners. The SDA confirmed the availability of the modified replacement part and recommended visual or dye penetrant inspection at regular intervals.

03/10/86

McMURRAY AVIATION
CESSNA 172M C-GRUG
FORT McMURRAY, ALBERTA 17 mi S
09 MARCH 1985

REPORT NUMBER: 85-W50010 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1845 MST
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	450	400
LAST 90 DAYS	12	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot with three passengers on board was returning to Fort McMurray after a weekend trip to Edmonton. En route, visual flight rules (VFR) weather conditions prevailed. As the aircraft neared Fort McMurray the pilot descended to tree-top level and followed a highway toward the airport. A few minutes later, the aircraft struck a wire spanning the highway. The pilot continued the flight and landed at Fort McMurray without difficulty.

The investigation revealed that the wire, which hung 36½ feet above the road, had severed the top 10 to 12 inches of the aircraft's tail and rudder. As the aircraft stands eight feet nine inches tall, its wheels were about 25 feet above the highway when it struck the wire. It was concluded that the aircraft was flown unnecessarily low.

FINDINGS:

Cause related:

1. The aircraft was flown unnecessarily low and it struck a wire spanning a highway.

Other:

-Nil-

17/09/86

FORDE LAKE AIR SERVICES
CESSNA A185F C-GGNM
FORDE LAKE, ONTARIO ½ mi SW
20 MAY 1985

REPORT NUMBER: 85-050034 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1930 EDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	800
LAST 90 DAYS	7	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The float-equipped aircraft had just departed from Forde Lake on a charter flight to a hunting camp to pick up some passengers. After take-off, as the pilot was selecting climb power, the engine (Continental 10-520-D-24) lost power. The aircraft was over trees at the time, and the pilot turned towards a small lake to attempt a landing. As the aircraft neared the lake, the pilot was forced to stretch the glide to clear the trees at the edge of the lake. The aircraft stalled just as it cleared the trees, and the nose pitched down. The pilot attempted to round out, but the aircraft landed hard on the water causing substantial damage to the aircraft. The aircraft sank slowly as it drifted towards shore, coming to rest partially submerged near the shoreline.

Extensive engine testing, which was carried out in an engine test cell, failed to reveal the cause of the power loss.

The emergency locator transmitter (ELT) was ineffective in aiding in the search for the downed aircraft. The investigation revealed that the ELT was serviceable and had been activated; however, the antenna lead had not been connected to the ELT. As a result, the range of the signal was less than one-half mile.

FINDINGS:

Cause Related:

1. The engine lost power for undetermined reasons.

2. The aircraft stalled while the pilot was attempting to extend the aircraft glide path to avoid trees.

Other:

1. The ELT was ineffective in aiding search and rescue operations because the antenna lead had not been connected to the ELT.

03/10/86

AIRCRAFT ACCIDENT REPORT

NORTH AMERICAN ROAD LTD.
MITSUBISHI MU-2B-35, C-GLOW
EDMONTON, ALBERTA
6 DECEMBER 1981

REPORT NUMBER 81-W10137

SYNOPSIS

The aircraft was on a night visual approach to runway 30 at Edmonton Municipal Airport. The aircraft departed from controlled flight and struck the roof of a hospital one mile short of the runway. The aircraft experienced a reduction or loss of engine power for undetermined reasons.

1 May 1986

Ce rapport est également disponible en français.

3.0 CONCLUSIONS

3.1 Cause-Related Findings:

1. The aircraft experienced a reduction or loss of engine power to one or both engines for undetermined reasons.
2. The aircraft departed from controlled flight on final approach.

3.2 Other Findings:

1. Shoulder harnesses would have reduced the severity of crew injuries.
2. Flight data and/or cockpit voice recorder information would have, in all probability, indicated the cause of the accident and greatly reduced the time and cost of the investigation.
3. The ELT was ineffective because the antenna had separated from the ELT at impact.
4. The flight was certified and qualified crew members were licensed to conduct the flight in accordance with existing regulations.
5. The aircraft was certified, equipped, and maintained in accordance with existing regulations.
6. The weight and centre of gravity were within the prescribed limits.
7. There was no known airframe in-flight failure prior to impact.

4.0 RECOMMENDATIONS

4.1 Actions Taken

4.1.1 Shoulder Harnesses

As a consequence of a previous Canadian Aviation Safety Board (CASB) Civil Aviation Occurrence Report (P40061), an Aviation Safety Advisory (5002-12-2-50046) was forwarded to the Department of Transport on 25 March 1985 concerning the requirement for each pilot seat in an aircraft to be equipped with a shoulder harness in addition to a lap belt.

The CASB notes the actions already taken by the Department of Transport through proposed revisions to Air Navigation Orders (ANO) Series II No. 2 which state in part:

a) that no person shall operate an aircraft engaged on a special purpose operation unless it is equipped with an approved seat and an approved individual safety belt, including shoulder harness, for each person on board the aircraft; and

b) after 1 January 1986, any aircraft which is first entered on the register of aircraft maintained pursuant to section 202 of the Air Regulations shall be equipped with a safety belt, comprised of a lap strap combined with a shoulder harness, at each pilot seat and for each front seat adjacent to a pilot seat.

4.2 Further Actions Required

4.2.1 Shoulder Harnesses

The CASB notes that the absence of a shoulder harness is frequently a contributing factor to the degree of injuries sustained in aviation occurrences in Canada. Consequently, the Board is concerned about the limited application of the proposed revisions to ANO Series II NO. 2 and the delay in their promulgation. It is the Board's view that all pilots should be provided with a restraint system incorporating a shoulder harness, regardless of the date of manufacture of the aircraft. At the same time, the Board recognizes that cockpit space, lack of secure mounting points, seat design and the resultant cost implications may preclude the retroactive installation of shoulder harnesses in some aircraft.

Nevertheless, the CASB intends to review the adequacy of the proposed revisions to ANO Series II No. 2 relative to Canada's experience in shoulder harness fitment. After consideration of the above, the Board may make recommendations for more stringent requirements for retrofitting shoulder harnesses.

4.2.2 Cockpit Voice Recorder/Flight Data Recorder

The CASB remains concerned that primary cause factors in many accidents, such as this accident involving a Mitsubishi MU-2B, go undetermined. There continues to be a lack of sufficient information, such as that which could be derived from a cockpit voice recorder (CVR) or flight data recorder (FDR), to assist the accident investigator. At present, ANO, Series II, No. 13 and 14 prescribe minimum CVR/FDR equipment requirements only for turbine engine powered, pressurized aircraft that:

a) have a maximum certified take-off weight of more than 12,500 pounds;

   and

b) are registered as commercial aircraft under Part II of the Air Regulations.

As a consequence of a previous CASB Civil Aviation Occurrence Report (040066) involving a Cessna 500 Citation, the CASB decided to prepare a statement of requirements for CVR/FDR equipment for a broader range of aircraft than currently prescribed, including helicopters. It is intended that this statement of requirements will result in a recommendation to amend ANO Series II, No. 13 and 14 in the near future.

CESSNA 210B C-GKNW
KELOWNA, BRITISH COLUMBIA
24 JULY 1983

REPORT NUMBER: 83-P34029 (Incident)
LOCAL TIME: 1249 PDT
OPERATION: Private Company Business
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	25
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

A loud bang was heard as the gear was selected up following take-off. The gear did not retract completely and could not be extended. The pilot flew for four hours in an attempt to get the gear to lock down and to burn off excess fuel. The nose gear indicated down and locked but the two main landing gears remained at an intermediate position. The pilot landed the aircraft on the grass infield of Kelowna Airport with only minor damage.

The right main gear actuator body had fractured close to the end where an internal snap ring was located. The end cap had been retained by the snap ring in the circumferential groove. The main gear actuator body contained a fatigue pre-crack of low-cycle, high-stress origin prior to the incident. The pre-crack extended from opposite sides of the outer corner of the snap ring groove inside the tube. The pre-crack had penetrated through the section on one side and through about 50 percent of the section on the other side. The actuator failed on its last retraction when normal operating loads were applied to the pre-cracked section.

When the actuator failed the hydraulic fluid for landing gear operation was depleted. As a result, retraction or extension of the landing gear was not possible. The emergency landing gear lowering system could not be used to extend the gear because the emergency system uses the same lines as the normal system.

The following laboratory report was completed: LP 300/83 - Main Gear Actuator Assembly.

.../2

FINDINGS:

Cause Related:

1. The right main gear actuator failed at the site of low-cycle high-stress fatigue pre-cracks.

2. The crack allowed the landing gear hydraulic system to be depleted of fluid which prevented normal gear extension or retraction.

3. The emergency system could not be used because it utilizes the same lines as the normal system.

Other:

-- Nil --

18/03/86

LUSCOMBE 8E C-FKUS
SOUTH PORCUPINE, ONTARIO
30 SEPTEMBER 1983

REPORT NUMBER: 83-034052 (Incident)
LOCAL TIME: 1900 EDT
OPERATION: Private Recreation
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	375	60
LAST 90 DAYS	16	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was unable to land at the destination airport due to reduced visibility in localized fog. A precautionary landing was carried out on a residential street near the airport. During the landing roll the pilot swerved to avoid a truck. The propeller and landing gear were damaged when the aircraft struck the street curb.

The investigation determined that a flight plan had not been filed nor had the weather at destination been checked prior to take-off. The pilot was unfamiliar with the navigation equipment on board and with darkness approaching there was not enough time to proceed to an alternate airport.

FINDINGS:

Cause Related:

1. The weather at destination was not checked prior to take-off.

2. Localized fog conditions were encountered at destination.

3. A precautionary landing was carried out onto a town street which was obstructed by a truck.

Other:

1. A flight plan was not filed.

19/09/85

PIPER J5A C-FYZL
ST-JEAN VOR, QUEBEC 10 mi NNW
22 OCTOBER 1983

REPORT NUMBER: 83-Q30072 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1410 EST
OPERATION: Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	60
LAST 90 DAYS	25	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

During a local flight, the passenger indicated that he felt ill. The pilot decided not to return to the airport of departure and carried out a landing on a gravel road into calm wind conditions. During the landing roll, the pilot felt a sudden loss of control, and the aircraft entered a ditch along the left side of the road. A post-accident inspection of the aircraft by the pilot revealed that the left spring of the tail wheel control assembly was missing.

It is possible that the left spring on the tail wheel control assembly broke and separated during the landing roll and that this failure limited directional control to the left. Directional control to the right, however, was still available. An overcontrol situation developed from a mix of tail wheel and brake inputs. As a result, the aircraft hit the ditch to the left of the road.

FINDINGS:

Cause Related:

1. It is likely that the left spring on the tail wheel control assembly broke during the landing roll on a dirt road.
2. The pilot lost directional control of the aircraft following the partial failure of the tail wheel assembly.
3. The aircraft entered a ditch.

Other:

- Nil -

19/11/85

PIPER PA-28R-200 C-GNIF
FERLAND, SASKATCHEWAN
30 OCTOBER 1983

REPORT NUMBER: 83-C34024 (Incident)
LOCAL TIME: 1745 CST
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	900	-
LAST 90 DAYS	15	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

On completion of a pleasure flight, a normal landing was completed on a grass airstrip. While at taxi speed, the nose gear collapsed.

Examination of the nose gear revealed that the downlock link between the actuating rod and the aft drag strut had fractured, and the corresponding latch bolt was bent. Wear marks indicated that the bolt had been bent for some time. The bent bolt caused a negative shift in the overcentre locking position. Although this shift was not sufficient to fully prevent the link from moving to the overcentre position during gear extension, it is likely that the particular combination of component wear, linkage displacement and the operating conditions at the time of the occurrence prevented a positive downlock.

What caused the latch bolt to bend could not be determined with certainty. However, the aircraft had had its nose gear damaged in 1977, and it is possible that the latch bolt was bent at that time.

The following laboratory report was completed: LP 445/83.

FINDINGS:

Cause Related:

1. The nose gear downlock latch bolt was bent.
2. Because of the combination of the bent latch bolt and normal component wear, positive nose gear downlock was not obtained.

Other:

-- Nil --

19/09/85

CESSNA T310R C-GVIG
HELMUT, BRITISH COLUMBIA 6 mi N
3 FEBRUARY 1984

REPORT NUMBER: 84-W40006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 PST
OPERATION: Private Company Business
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	540	337
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	2	-	-

SUMMARY REPORT:

The pilot, with two passengers on board, departed from Helmut Aerodrome on a planned instrument flight rules (IFR) night flight to Prince George, British Columbia. One of the passengers was also a pilot qualified on the Cessna 310 but was not instrument rated. There was no eyewitness to the aircraft's departure and the pilot did not open his flight plan. When the aircraft failed to arrive at its destination, a full scale air search was initiated. The aircraft wreckage was located six miles northeast of the Helmut Aerodrome, three days after it was reported missing.

The aircraft had struck the ground at high speed in a steep nose-down, right-wing-low attitude on a heading of 315 degrees magnetic. It had disintegrated on impact leaving a wreckage trail over 400 feet long. Examination of the wreckage did not reveal any evidence of pre-impact structural or mechanical failure. All three occupants sustained fatal injuries at impact. Post-mortem examinations did not reveal any evidence of incapacitation or impairment.

Official weather observations are not made at the Helmut Aerodrome. Witness observations and post-accident analysis indicate that a cloud ceiling existed about 3,000 feet above ground level with a visibility of about 10 miles beneath the cloud. As convective clouds moved through the area, localized snow showers would have reduced the ceiling to 500 feet and the visibility to about one-half to one mile for short durations. Much of the cloud cover would have been in the form of thin layers. Light icing was expected in the layered cloud while moderate mixed icing was anticipated in the convective clouds. Moderate turbulence from the surface to 14,000 feet was likely.

.../ 2

The wreckage was located in an area opposite to the direction of the intended flight. The heading of flight at impact indicates that after take-off, the aircraft entered and completed a 360-degree turn to the right. The impact marks on the trees and the ground scars suggest that the aircraft was in a spiral dive to the right.

The pilot had only recently acquired a Class II instrument rating and had accumulated limited in-cloud flying experience. He had failed his first two attempts at the instrument flight test, and on his successful third attempt, his flight accuracy was assessed as marginal for a Class II rating. The pilot had only about 30 hours actual instrument and 13 hours night-flying experience.

The location of the wreckage, the impact attitude and the level of the pilot's experience suggest that after take-off when the aircraft entered cloud, the pilot became disoriented and unknowingly commenced a right turn which developed into a spiral dive from which he could not recover.

FINDINGS:

Cause Related:

1. The aircraft struck the ground while in a steep spiral dive to the right.

Other:

1. The flight took place at night and in marginal weather conditions which are conducive to spatial disorientation.

2. The pilot was relatively inexperienced in instrument flying.

06/06/86

CESSNA 310P C-GEVV
CHARLOTTETOWN, PRINCE EDWARD ISLAND
20 FEBRUARY 1984

REPORT NUMBER: 84-A44006 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0813 AST
OPERATION: Private Company Business
DAMAGE: None
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,000	50
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

When the landing gear was selected up after take-off, the right gear remained down. The pilot selected the gear down and carried out a touch-and-go landing to determine if the right gear was locked down. It proved to be unlocked, and the pilot decided to raise the left main gear and nose gear in order to carry out a belly landing, on the assumption that the right gear would collapse on landing. This was attempted; however, on touchdown, the right gear did not collapse, and an overshoot was carried out. As it now appeared that the right gear was locked down, the landing gear was selected down, and an uneventful landing was made.

Fatigue failure of a right landing gear fork bolt had severed the connection between the torque tube and the push-pull rod assembly, thus preventing retraction of the right gear. These fork bolts have a recommended life of 2,000 hours; however, this particular bolt had been in service for 3,350 hours.

.../2

FINDINGS:

Cause Related:

1. Service life beyond that recommended resulted in fatigue failure of the right landing gear fork bolt, which, in turn, prevented retraction of the right gear.

Other:

- Nil -

29/09/86

BEECH 200 C-GHOP
VERMILION AIRPORT, ALBERTA
02 MARCH 1984

REPORT NUMBER: 84-W40014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1615 MST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11,000	2,000
LAST 90 DAYS	100	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	8

SUMMARY REPORT:

The aircraft departed Hardisty, Alberta on a day visual flight rules (VFR) flight to Vermilion, Alberta. As the flight progressed, the weather conditions deteriorated, forcing the pilots to air file an instrument flight plan. Upon arrival, an instrument approach was carried out. The aircraft broke out of the solid cloud base at 500 feet above ground level, and the visibility was more than 10 miles. On final approach, the first officer advised the captain, who was flying the aircraft, that the airspeed was "a little low". The airspeed was noted to be slightly less than 100 knots. The captain remarked, "No problem, it just won't be a smooth landing." The aircraft landed on the runway in a right-wing-low, nose-high attitude, and the right main landing gear collapsed. The aircraft veered off the right side of the runway through a snowbank and travelled approximately 1,000 feet through compacted snow before the left and nose landing gear failed. The aircraft slid to a stop on its belly, approximately 1,200 feet from the button of the runway.

The Beech 200 flight manual gives an approach speed of 102 knots for the aircraft weight and configuration. The final approach was flown at less than 100 knots, resulting in a high sink rate at landing.

.../2

02/10/86

Examination of the right landing gear revealed that the drag strut had collapsed due to compressive overload as a result of the hard landing. Testing-to-destruction was carried out on the drag strut assembly, and it was determined that the strut failed at a load close to that specified by the manufacturer.

Following the accident, the emergency locator transmitter (ELT) was found switched to the "off" position.

The following laboratory report was completed: LP 114/84 - Right Landing Gear Failure.

FINDINGS:

Cause Related:

1. The crew failed to maintain an adequate airspeed on final approach which resulted in a high sink rate and a hard landing.

2. The right main landing gear collapsed because of an overload caused by the hard landing.

Other:

1. The ELT was found switched to the "off" position.

02/10/86

CESSNA 180K, C-GBFJ
ST. ANDRE AVELLIN, QUEBEC
9 MARCH 84

REPORT NUMBER: 84-Q40011
LOCAL TIME: 1120 EST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student Pilot

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	71	65
LAST 90 DAYS	23	23

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was returning to base after a visual flight rules (VFR) solo practice flight.

As the aircraft descended through 3,500 feet the engine stopped and all attempts to restart were unsuccessful.

The pilot declared an emergency and selected a stretch of highway for a forced landing. Just prior to touchdown, the right wing struck an electrical wire and then a telephone pole which caused substantial damage to the aircraft.

It was reported that the student had been assured by the instructor, before and during the flight, that adequate fuel remained for the solo flight. Prior to departure, the fuel tanks had not been checked visually by either the student or the instructor. The investigation determined that the fuel gauges were inaccurate. When the engine failed, the gauges indicated that there was adequate fuel for VFR flight when, in fact, no fuel remained.

The student's training record indicated that although she had received considerable dual instruction she had not been taught forced or precautionary landings.

.../2

DATE: 09/5/85

FINDINGS:

Cause Related:

1. The fuel gauges were not reading within the specified tolerance.
2. The fuel had not been checked visually by either the instructor or the student prior to the student's solo flight.
3. The student had not been taught forced or precautionary landings.

Other:

- Nil -

DATE: 09/05/85

COLLISION BETWEEN: CESSNA 172P C-GSPV and
CESSNA 150L C-GEAC
TRAIL, BRITISH COLUMBIA 2 mi N
LOCAL TIME: 1150 PST
29 MARCH 1984

CESSNA 150 C-GEAC

REPORT NUMBER: 84-P40801 (Accident)
INFORMATION SOURCE: Field Investigation
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	339	310
LAST 90 DAYS	7	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

CESSNA 172 C-GSPV

SELAIR PILOTS ASSOCIATION
REPORT NUMBER: 84-P40802 (Accident)
OPERATION: Flying Club Training
DAMAGE: Destroyed
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES		ON TYPE	
	INSTRUCTOR	TRAINEE	INSTRUCTOR	TRAINEE
TOTAL	4,786	102	3,500	59
LAST 90 DAYS	190	32	190	32

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	2	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

Two aircraft collided while flying at about 5,000 feet in clear weather two miles north of the city of Trail. During the collision, the left landing gear of the Cessna 150 damaged the right wing of the Cessna 172. The wing failed and the Cessna 172 went into an out-of-control vertical dive. The Cessna 172 was destroyed on impact, and both occupants were killed. The Cessna 150 returned safely to its departure aerodrome.

.../2

The crew of the Cessna 172 had departed from the Castlegar Airport, intending to practise forced landings using the Trail Airport. On board were a flying instructor and a pilot undergoing training for a commercial licence. The Cessna 172 reported clear of the Castlegar control zone to the south. The collision occurred about three minutes later while the Cessna 172 was wings-level on a southerly heading.

The Cessna 150 had also departed from Castlegar Airport, five minutes before the Cessna 172. The purpose of the flight was to practise steep turns and forced landings in an area south of Castlegar. The pilot of the Cessna 150 reported clear of the Castlegar control zone and then contacted Castlegar Flight Service Station, reporting that he would be in the practice area for about the next hour at four to six thousand feet. At the time of this radio transmission, the crew of the Cessna 172 was using a different radio frequency and was not aware of the intentions of the Cessna 150.

The pilot of the Cessna 150 was conducting a series of steep turns. After rolling out of a steep right turn, the pilot checked his instruments to gauge the accuracy of his heading control and then looked up and saw the Cessna 172 directly in front of him, coming toward him. The Cessna 172 flew underneath the Cessna 150 and the Cessna 150 pilot felt a jolt and heard a "bang". The pilot of the Cessna 150 looked back and thought the Cessna 172 was still flying in level flight, but then he lost sight of the other aircraft. The Cessna 150 made a radio call to determine if the other aircraft had been damaged, but no reply was received. The pilot of the Cessna 150 then returned to Castlegar and decided to carry out touch-and-go training. During the landing roll, the aircraft was vibrating badly, and the pilot brought the aircraft to a full stop. The tower controller advised the pilot that his left landing gear was damaged and inquired whether the Cessna 150 had been flying near the location of the crash of the Cessna 172. The pilot replied that he had been in the area.

The pilots of the two aircraft did not observe each other in time to avoid the collision. The Cessna 150 was likely obscured to the crew of the Cessna 172 as it came from the direction of the sun. In addition, because of the type of training being conducted by the crew of the Cessna 172, it is likely that they were looking down at possible forced-landing sites. While the pilot of the Cessna 150 was carrying out a steep turn, it would have been difficult for him to see the Cessna 172.

.../3

28/05/86

FINDINGS:

Cause Related:

1. The crews of the Cessna 150 and the Cessna 172 did not observe each other in time to avoid a collision.

2. The Cessna 172 crashed when its right wing failed after being struck by the left landing gear of the Cessna 150.

Other:

-- Nil --

28/05/86

COLLISION BETWEEN: BEECHCRAFT C-35 C-FKHV and
CESSNA 152 C-GQSY
BRAMPTON AIRPORT, BRAMPTON, ONTARIO
28 APRIL 1984

LOCAL TIME: 1230 EST
INFORMATION SOURCE: Field Investigation

BEECHCRAFT C-35 C-FKHV

REPORT NUMBER: 84-040801 (Accident)
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE. Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	219	104
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

CESSNA 152 C-GQSY

REPORT NUMBER: 84-040802 (Accident)
OPERATOR: Brampton Flying Club
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	47	47
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The Beech Bonanza and the Cessna 152 collided on Brampton Airport's runway 32 where it intersects the parallel taxiway for runway 26.

The Bonanza had departed from runway 32 for a local visual flight rules flight. On return to the airport, the pilot joined the traffic pattern and followed another aircraft while making his approach to the same runway. Just after touchdown, the left wing tip struck the Cessna 152 which had stopped near the runway edge.

.../2

The Cessna had been taxiing to runway 32 for take-off when area traffic was advised that the wind had shifted to favour runway 26. As the pilot began taxiing across runway 32, he noticed the Bonanza landing. Although he stopped, he was occupying the runway and the Bonanza's left wing struck the Cessna and damaged the nose cowl and left wing.

Investigation revealed that the Cessna pilot had heard the runway change broadcast on UNICOM frequency, but that the Bonanza pilot had not. The Bonanza pilot continued his approach to runway 32. Although he had seen the Cessna taxiing towards runway 32 during his circuit, he did not notice the aircraft again until after the collision.

In order to reach runway 26, the Cessna pilot had to cross runway 32. He had not heard any radio transmission from the Bonanza and did not see the Bonanza on approach to runway 32 until he had begun to cross the runway. He then stopped but was unable to avoid the collision.

The Bonanza's transmissions were not heard by the Cessna and the Bonanza in turn may not have been receiving some transmissions. Brampton is an uncontrolled airport, however, and operations by NORDO aircraft were permissible and common.

Section 529 of the Air Regulations states, "Where an aircraft is in flight or manoeuvring on the ground or water, the pilot-in-command shall give way to other aircraft landing or about to land".

FINDINGS:

Caused Related:

1. The Cessna pilot began to cross runway 32 when the Bonanza was about to land.

2. Neither pilot saw the other aircraft in time to avoid the collision.

Other:

-- Nil --

03/04/86

GRUMMAN AA5B C-GBZJ
SALTCOATS, SASKATCHEWAN
3 MAY 1984

REPORT NUMBER: 84-C44016 (Incident)
LOCAL TIME: 0835 CST
OPERATION: Private Recreational
DAMAGE: None
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	684	220
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

While cruising at 7,500 ft asl a power interruption and severe vibration were experienced. The engine (Lycoming O-360-AYK) was shut down and a forced landing was carried out onto a grid road.

It was reported that the No. 4 cylinder exhaust valve had failed.

FINDINGS:

Cause Related

1. The No. 4 cylinder exhaust valve failed.

Other

- Nil -

19/09/85

CESSNA T210M C-GPTV
KAMLOOPS AIRPORT, BRITISH COLUMBIA
03 MAY 1984

REPORT NUMBER: 84-P44003 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1952 PDT
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	450	Not Available
LAST 90 DAYS	Not Available	Not Available

INJURIES:	FATAL	SERIOUS	MINER/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The aircraft was on a flight from Calgary, Alberta to Salmon Arm, British Columbia. When the pilot selected the landing gear down, the green light, which indicates that the nose gear is down and locked, would not illuminate. The aircraft was flown to Kamloops where the tower operater confirmed that the main wheels were down and that the nose gear doors were only partially open. The pilot flew around the local area for an hour and a half attempting various procedures to get the nose gear down. Unsuccessful, he returned to Kamloops where he carried out a wheels-up landing on the grass parallel to the runway.

This was the aircraft's third flight after a 100-hour inspection had been carried out. When the gear was selected down after the second flight, the nose gear would not extend; however, when the pilot reselected the gear, it extended. After the second flight, the flight maintenance personnel jacked up the aircraft and carried out retraction tests and lubricated the gear. During the investigation of the incident flight, it was revealed that nine screws were missing from the turbo charger access panel. This condition allowed the airflow through the engine cowling to displace the access panel. As a result, when the gear was selected down, the right forward nose door was prevented from opening by contact with the panel. According to the evidence, the screws were not reinstalled after the 100-hour inspection.

FINDINGS:

Cause Related:

1. Nine screws were not reinstalled in the turbo charger access panel after a 100-hour inspection.

2. The panel was displaced by the airflow, thus preventing the right forward nose gear door from opening fully.

3. The absence of the screws was not detected during maintenance action following a reported gear extension problem.

Other:

- Nil -

06/08/86

PIPER PA22-150 C-GURQ
LAC LA BICHE, ALBERTA
21 MAY 1984

REPORT NUMBER: 84-W40031 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1345 MDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	31	31
LAST 90 DAYS	9	9

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was practising take-offs and landings on a hard-surfaced runway. He landed the aircraft on the main wheels and maintained partial power to help keep the tail up. As the tail settled, the aircraft veered to the left. The pilot applied hard right rudder, and the aircraft turned sharply to the right. The left main gear collapsed, and the left wing contacted the runway. The pilot did not reduce power as the tail settled.

The closest weather reporting station, 60 miles distant, reported weather that should have been ideal for the flight; the pilot reported occasional gusty wind conditions.

Landing on the main wheels with partial power applied would result in a touchdown at higher than normal airspeed. With the power still applied as the tail settled, the aircraft would tend to veer left due to the gyroscopic effect of the engine and propeller. The pilot overcorrected, and the sharp right turn put a heavy side load on the left main gear, causing it to collapse.

FINDINGS:

Cause Related:

1. The aircraft touched down at a higher than normal airspeed.

2. The student pilot did not reduce power at the appropriate time during the landing.

3. The student pilot applied excessive right rudder which caused the aircraft to swing sharply to the right. The left landing gear collapsed due to the heavy side loads.

Other:

- Nil -

02/10/86

CESSNA 170B C-FIUD
MALARTIC, QUEBEC
01 JUNE 1984

REPORT NUMBER: 84-Q40032 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	301	276
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed at a private airstrip in a cross-wind equal to the maximum demonstrated cross-wind limitation (11 kt). During the landing roll, the aircraft encountered a sudden gust of wind, and the aircraft yawed to the right. The pilot attempted to correct the yaw with left brake inputs, but the aircraft continued to roll off the runway and struck a maintenance vehicle which was parked nearby.

Because of the damage sustained by the left main gear assembly, it was not possible to establish if the left brake was serviceable prior to the accident. Directional control could not be maintained as the gust of wind exceeded the 11 kt maximum demonstrated cross-wind limitation.

FINDINGS:

Cause Related:

1. The gust of wind exceeded the maximum demonstrated cross-wind limitation of the aircraft.

2. The aircraft yawed to the right.

3. The left brake was ineffective during the attempt to regain directional control.

4. The aircraft collided with a vehicle which was parked near the runway.

Other:

- Nil -

19/09/85

PIPER PA 34-200 N57319
DAVIN LAKE, SASKATCHEWAN
25 JUNE 1984

REPORT NUMBER: 84-C40907 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1815 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Airline Transport (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,700	50
LAST 90 DAYS	250	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The aircraft touched down smoothly on the sand-covered landing strip. After a brief landing roll, the left main landing gear collapsed, and the aircraft came to rest 850 feet from the threshold. Damage was limited to the left landing gear, left wing tip, and the left propeller.

It was reported by the pilot that the landing gear had collapsed because the left main gear sprocket had failed due to normal wear; however, the failed part was not available for laboratory analysis. There were no reported pre-crash malfunctions, or unserviceabilities.

FINDINGS:

Cause Related:

1. The left main landing gear sprocket failed moments after the aircraft touched down, causing the left gear to collapse.

Other:

-Nil-

17/09/86

BELLANCA 7GCBC C-GULF
MCCORMICK RANCH, BRITISH COLUMBIA Mile 143 Alaska Highway
02 JULY 1984

REPORT NUMBER: 84-W40041 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2215 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	307	250
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed in a field with the intention of visiting a friend. After shutdown, he was advised that the field was crop land. He immediately prepared to take off from the field in the opposite direction to his landing. The field was quite soft with a slight downgrade in the direction of take-off. As he approached the end of the field, the pilot rotated the aircraft. During the lift-off, the aircraft struck the top strand of a barbed wire fence, then rolled to the right and descended into a ravine. It then struck the trees on the far embankment, and caught fire. Witnesses at the scene extinguished the fire and removed the unconscious pilot from the aircraft. He was not wearing his shoulder harness.

The pilot had landed in farm fields numerous times. Usually he checked the suitability of these fields for take-offs and landings on foot before flying into them. However, in this case, he had completed his reconnaissance of the landing area from the air. After landing, he realized that the field was shorter and softer than he had judged it to be. Just prior to take-off the pilot exited the aircraft and walked around to briefly view the departure area again.

... /2

The investigation revealed that the pilot was concerned that the condition of the field may have been unsuitable for take-off. Because the field was soft, a substantial increase in the amount of ground roll was required to attain the desired lift-off speed. In accordance with the recommended take-off technique for soft fields, the tail wheel was lifted just clear of the ground after the beginning of the ground run. As the aircraft approached the far end of the field, it was pulled into the air in a nose-high attitude and the tail wheel contacted the ground. The aircraft was in this attitude when the main landing gear struck the wire fence.

FINDINGS:

Cause Related:

1. The soft field was of insufficient length to permit a safe take-off.
2. The aircraft struck the fence at the end of the field.
3. The pilot's injuries were more severe because the shoulder harness was not being worn.

Other:

1. Quick rescue by witnesses saved the unconscious pilot from being burned in the post-crash fire.

19/08/86

CESSNA 150J C-FXNU
COLEMAN, ALBERTA 5 mi W
11 JULY 1984

REPORT NUMBER: 84-W40043 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,300	1,000
LAST 90 DAYS	57	57

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and passenger were carrying out low level aerial photography from a light two-place aircraft in the Alberta foothills, when the wind became too gusty for them to continue. Deciding to return to the airport, the pilot initiated a climbing turn to orient himself. While turning, the aircraft flew too close to a ridge, struck a fence post on the ridge and nosed over.

The accident occurred in a deep valley between two ridges. The density altitude was about 7,000 feet above sea level. As well, a moderate westerly wind was causing a downdraft in the lee of the ridge toward which the aircraft turned. Loaded to near maximum gross weight, with two men and photographic equipment on board, the aircraft's climb performance was very limited.

The high density altitude, aircraft weight, and downdraft resulted in reduced performance. The pilot did not take into account the reduced aircraft performance and flew too close to the ridge.

Although a shoulder harness was available, the passenger did not wear it, and, as a result, he sustained minor facial injuries.

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FINDINGS:

Cause Related:

1. Because of the combination of high density altitude, near maximum gross weight, and the downdraft, the aircraft climb performance was limited.
2. During his turn, the pilot flew too close to the ridge.
3. The aircraft struck a fence post on the ridge.

Other:

1. Although a shoulder harness was available, the passenger did not wear it, and, as a result, he sustained minor facial injuries.

17/09/86

PIPER PA-23 C-FAKX
THUNDER BAY, ONTARIO 20 mi W
13 JULY 1984

REPORT NUMBER: 84-C40049 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1515 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,300	400
LAST 90 DAYS	20	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	2	1

SUMMARY REPORT:

The aircraft, which was at near maximum gross weight, departed Thunder Bay, Ontario with four persons on board. Approximately seventy-five miles west of Thunder Bay, while the aircraft was cruising at 3,500 feet above sea level (asl), the right engine oil pressure began to decrease, and oil appeared on the wing and flap. The pilot decided to turn back towards Thunder Bay, the nearest airport. When the oil pressure reached zero, the pilot shut down the right engine and feathered the propeller. With the left engine at full power, the aircraft descended at about 100 feet per minute. Twenty miles west of Thunder Bay, the pilot intentionally stalled the aircraft into the tree-tops at an airspeed of about 55 mph. The aircraft came to a stop on the forest floor, and a fire, which consumed the left wing from the engine outboard, ensued. The crash site was located at 1900, and rescue operations were completed by 0230 on 14 July 1984. The pilot and two passengers were seriously injured.

The right engine (Lycoming 0-32-B3B) was examined; however, because of engine damage resulting from the impact, the reason for the oil loss could not be determined. The left engine was operating normally prior to impact.

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19/12/86

The aircraft was unable to maintain height when operating on one engine at near maximum gross weight. The PA-23, with the 160 horsepower Lycoming engine, was given type approval on 14 October 1957, under the existing requirements of Civil Air Regulations 3. Under the regulations, it was not necessary for the aircraft to be able to climb or maintain altitude when operating on a single engine. As well, it was not necessary for the single-engine climb performance to be determined.

On an earlier flight, the aircraft's emergency locator transmitter (ELT) had activated in flight. The pilot could not deactivate it and had to disconnect the antenna. A laboratory examination determined that the barrel in which the arming switch travelled was worn and fretted, causing the switch to bind. When exposed to aircraft in-flight vibrations, the switch activated the ELT, but, because of the fretting, it did not release automatically. The ELT, therefore, could not be turned off, and the antenna had to be disconnected. After impact, the pilot reconnected the antenna, and the ELT functioned normally.

The right engine lost oil for undetermined reasons. The pilot had shut down that engine, but flight could not be sustained, and the aircraft descended into the trees. Had the pilot not been able to reconnect the antenna, the ELT would not have been available for search and rescue purposes.

The following laboratory report was completed: LP 294/84-ELT Examination Piper PA-23, C-FAKX.

FINDINGS:

Cause Related:

1. For undetermined reasons, the right engine lost oil, and, as a result, the pilot shut down the engine.
2. The pilot was unable to maintain level flight with only one engine operating, and the aircraft descended into the trees.

Other:

1. The type approval did not require that the aircraft be able to climb or maintain altitude when operating on a single engine.
2. The ELT had to be manually activated by the pilot after impact, because the arming switch was defective.

19/12/86

CESSNA 172 C-GTHA
SPRINGBANK AIRPORT, ALBERTA
18 JULY 1984

REPORT NUMBER: 84-W40046 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2257 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	180	110
LAST 90 DAYS	14	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was on a cross-country flight on a dark moonless night. Approaching Springbank Airport, the aircraft was cleared for a straight-in approach to runway 25. As the pilot rounded out at approximately 15 feet above the ground, the aircraft stalled. The aircraft hit the runway, and the nosewheel collapsed. The aircraft then flipped over and broke in half as it struck the runway. The pilot and his passenger crawled out through the broken windshield.

Investigation revealed that in the previous eighteen months, the pilot had flown less than one hour at night. Also, the lighting for the pilot's flight instruments was so dim that the needle on the airspeed indicator was hardly visible, and the pilot had to use a flashlight to read the numbers on the dial. This situation would have prevented the pilot from concentrating fully on flying the approach and, in addition, would have had some effect on his night vision. Although the pilot was aware of the dim lights, he did not have the problem rectified.

The pilot, who was not current with night operations, allowed his concentration to be diverted while on final, and, as a result, he rounded out too high and stalled the aircraft.

.../2

02/10/86

FINDINGS:

Cause Related:

1. The pilot had very little recent night flying experience.
2. The instrument lights for the flight instruments were too dim.
3. The pilot's use of a flashlight degraded his night vision on the final approach.
4. The pilot was unable to concentrate fully on flying the approach and, consequently, rounded out too high, stalling the aircraft.

Other:

- Nil -

02/10/86

BELLANCA CITABRIA 7GCBC C-GXMN
BLACK DIAMOND GLIDER FIELD, ALBERTA
19 JULY 1984

REPORT NUMBER: 84-W40048 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2005 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	34
LAST 90 DAYS	100	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was being flown as a glider tow plane from a private field and was returning to land in a wind which had been from the west but which was beginning to veer. On downwind, the pilot checked the wind sock and observed that there was a 90-degree cross-wind. The pilot was flying a higher than normal approach and started his flare halfway down the strip. On the roll-out, approximately three-quarters of the way down the strip, the pilot applied full power for a go-around. He then rejected the go-around attempt, but he was unable to stop the aircraft before the end of the strip, and the aircraft was substantially damaged.

The wind was 90 degrees to the runway when the pilot checked the direction on downwind; however, during the final approach, the wind veered sufficiently to introduce a downwind component. It was normal practice for the pilot to come in high over a fence on the approach as he was dragging a 200-foot glider tow cable, and he did not want to snag it on the fence. Touching well down the strip, the pilot became aware that the distance to go was critical and applied full power to go-around. He then decided the aircraft was not accelerating to his satisfaction and rejected the go-around. The combination of the high approach, the downwind condition, and the momentary burst of power made it impossible to avoid overrunning the end of the strip.

FINDINGS:

Cause Related:

1. The wind had veered introducing a downwind component.
2. The approach was carried out high because of the 200-foot glider tow cable which was being dragged behind the aircraft.
3. The pilot attempted and then rejected a go-around.

Other

- Nil -

17/09/86

PIPER PA18-135 C-FBXS
RABBIT RIVER STRIP, BRITISH COLUMBIA
21 JULY 1984

REPORT NUMBER: 84-W40049 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1900 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	340	180
LAST 90 DAYS	23	21

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot, accompanied by a passenger, flew from Muncho Lake to the strip at Rabbit River to search for some missing horses belonging to the passenger. On final approach, the calm wind condition changed to a gusty tail wind. The pilot decided to go around and applied take-off power. At about 150 feet, the engine rpm dropped from 2600 to 1100. Due to high obstructions, the pilot decided to carry out a forced landing straight ahead in a swampy area. After touchdown, the main wheels sank, and the aircraft overturned.

The pilot reported that he believed that the engine muffler baffle had broken loose and restricted the exhaust, and as a result, there was a loss of power during the attempted overshoot. However, this information could not be confirmed. The cause of the loss of engine power could not be determined.

FINDINGS:

Cause Related:

1. During an overshoot, the engine lost power for undetermined reasons.
2. During the forced landing, the aircraft overturned when the wheels sank in the swampy area.

Other:

- Nil -

26/07/86

CESSNA 172M C-GEBP
BONNYVILLE, ALBERTA
05 AUGUST 1984

REPORT NUMBER: 84-W40053 (Accident)
LOCAL TIME: 1100 MDT
OPERATION: Private
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	250	10
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

On the first approach of a training flight, the pilot selected full flap. The aircraft descended below the ideal approach path; the pilot applied power and raised the nose. The aircraft touched down on the end of the runway and became airborne again. Although the throttle was then closed, the aircraft climbed to approximately 30 ft. It then settled back heavily on to the runway, and the nose gear collapsed.

The pilot had flown only 50 hours in the last four years and had not flown during the previous six months. The owner, a private pilot, occupied the right seat to monitor the flight at the pilot's request, but did not have any instructional experience. Neither pilot recognized the impending bounced landing. Incorrect recovery technique was used which resulted in the hard landing.

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FINDINGS:

Cause Related:

1. The pilot-in-command lacked recent flying experience.

2. The correction made to regain the approach path resulted in a bounced landing.

3. Incorrect recovery action was taken after the aircraft bounced on landing.

Other:

— Nil --

19/09/85

CESSNA 305A C-FTGA
PRINCETON, BRITISH COLUMBIA
07 AUGUST 1984

REPORT NUMBER: 84-P40042 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1534 PDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	711	80
LAST 90 DAYS	34	34

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had just released a glider and was returning to land. He checked the wind sock and then made the approach to runway 03. Following a three-point landing, the aircraft began to veer to the left as the pilot was repositioning his feet to reapply the brakes. In an attempt to regain directional control, the pilot applied rudder and brake but was unsuccessful. The aircraft ground looped, and as it left the runway, the right main gear collapsed. The aircraft came to a stop with its weight on the left main gear and the right wing tip.

The wind was from 290 degrees at 9 knots and was within the demonstrated cross-wind limitations for the aircraft. It was not determined what caused the loss of control and the subsequent ground loop. Although the pilot applied the correct recovery action, it was too late to stop the swing. The right main gear likely failed because of overload.

FINDINGS:

Cause Related:

1. Directional control was lost following landing, and the aircraft ground looped.

2. The right main gear failed during the ground loop likely due to overload.

Other:

- Nil -

26/07/86

CESSNA 206 C-FPYD
PRINCE ALBERT, SASKATCHEWAN
25 AUGUST 1984

REPORT NUMBER: 84-C40074 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1100 CST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	265
LAST 90 DAYS	35	35

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was on final approach at low altitude when the engine lost power. The pilot switched from the left to the right fuel tank but was unable to restart the engine. As the area ahead was obstructed, the pilot attempted a turn, but the left wing and nosewheel struck the ground and the aircraft was substantially damaged.

The investigation revealed that the engine had stopped because of fuel exhaustion of the left fuel tank; sufficient fuel remained in the right tank to supply the engine. The pilot believed that the fuel gauges were inaccurate and calculated the fuel remaining in each tank according to fuel consumption over time. The pilot stated that he was uncertain of the amount of fuel remaining in each tank and inadvertently selected the tank containing the least amount of fuel at the start of the flight.

The auxiliary fuel pump is normally left off for landing. The engine restart check-list calls for the pump to be selected on, but this was not done. As a result, the pressurized fuel supply required for an engine restart was not available, even though the right fuel tank, which contained sufficient fuel to run the engine, had been selected.

FINDINGS:

Cause Related:

1. The fuel gauges were considered to be inaccurate, and as a result, the left fuel tank which contained the least amount of fuel was inadvertently selected at the beginning of the flight.

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2. The engine lost power because of fuel starvation.
3. Because the auxiliary fuel pump was not selected on, pressurized fuel was unavailable for an engine restart.
4. The aircraft was substantially damaged while manoeuvring to a more acceptable forced-landing area.

Other:

- Nil -

06/06/86

PZL-104, WILGA-80 C-FLUF
CASTLE TOWERS MOUNTAIN, BRITISH COLUMBIA
07 SEPTEMBER 1984

REPORT NUMBER: 84-P40049 (Accident)
INFORMATION SOURCE. Field Investigation
LOCAL TIME: 1400 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,300	136
LAST 90 DAYS	23	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	1

SUMMARY REPORT:

A short time after landing on a glacier, the pilot became aware of a strong wind with gusts blowing to about 25 mph down the face of the glacier. He informed his passenger that he did not like the situation and that they should leave before the wind became too strong. On the first take-off run down the glacier, the surface was sticky so the pilot rejected the take-off. He taxied back for a second attempt along the same ski tracks that were made during the first take-off run; however, as he did not return to the initial starting point, he did not take advantage of all the take-off distance available.

The pilot selected 32 degrees of flap and applied full power. The aircraft accelerated rapidly, and hoping to help the aircraft out of the snow, the pilot selected full flap. When nothing happened, he looked to see if the flaps were down and noticed that there was blowing snow travelling alongside of the aircraft, indicating a very strong tail wind.

The take-off surface of the glacier sloped downward and was interspersed with crevasses. When one of the crevasses loomed in front of the aircraft, the pilot had no time to reject the take-off so he attempted to fly the aircraft across the crevasse. The aircraft cleared the first crevasse only to land in another crevasse that was parallel to the take-off path. The aircraft came to rest suspended with the fuselage jammed in the crevasse and the wings resting on the surface. Because of the aircraft's position, neither the pilot nor the passenger made any attempt to escape; they were rescued the following morning.

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It is not known if under the existing conditions, the pilot could have taken off successfully if he had used all the space available or selected an alternate take-off path.

FINDINGS:

Cause Related:

1. The take-off surface chosen was hazardous because of the presence of crevasses.
2. Only a portion of the take-off distance available was being used.
3. The take-off was attempted with a strong gusty tail wind.
4. Before the aircraft could attain lift-off speed, it encountered a crevasse.

Other:

- Nil -

06/08/86

PIPER PA-32RT-300T N22002
SUMMIT LAKE, BRITISH COLUMBIA
10 SEPTEMBER 1984

REPORT NUMBER: 84-W40904 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1050 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	520	60
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	1	-	-

SUMMARY REPORT:

The pilot departed on a visual flight rules (VFR) flight along the Alaska Highway from Watson Lake to Fort St. John, British Columbia. The weather was marginal VFR at the time with low ceilings and visibility reduced because of rain and snow. The pilot requested and received a special VFR departure out of the Watson Lake zone and proceeded along the route into these poor conditions. Summit Pass residents observed that the aircraft was flying at about 100 feet above the highway. The pilot made a left-hand 180-degree turn, followed shortly after by a 90-degree turn from track. The aircraft struck the mountain and travelled about 200 feet before coming to a stop and both occupants were killed.

The highest elevation point along the route is Summit Pass; it was closed in by cloud and was impassable. The investigation revealed that on the previous day the pilot attempted the flight into the same weather conditions, and at Summit Pass he was forced to reverse direction and return to Watson Lake. After delaying one day at Watson Lake, the pilot received a weather briefing in the morning. He was advised of the conditions en route and that the pass would be even worse due to its high elevation. According to the evidence, when the aircraft reached Summit Pass, the pilot realized that the aircraft would not be able to proceed through the pass and attempted to turn back. However, because of poor visibility and a possible accumulation of ice on the windshield, the pilot may have become disoriented and as a result, made the 90-degree turn into the mountain.

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The technical investigation failed to reveal any pre-impact failure or malfunction of the airframe or flight controls.

FINDNGS:

Cause Related:

1. The VFR flight was continued in adverse weather.
2. The aircraft crashed during an attempt to reverse heading in mountainous terrain.

Other:

- Nil -

06/08/86

CESSNA 421B N69RF
VANCOUVER INTERNATIONAL AIRPORT, VANCOUVER, BRITISH COLUMBIA
13 SEPTEMBER 1984

REPORT NUMBER: 84-P40905 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,000	10
LAST 90 DAYS	115	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

After take-off from Vancouver on a visual flight rules (VFR) flight to Seattle, Washington, the pilot requested and obtained clearance to fly over West Vancouver before setting course. About 15 minutes later, the pilot heard an unusual sound. He checked the instruments and noticed that the right main gear light was indicating that the gear was down and locked. The passenger then informed him that the right engine appeared to be on fire. The pilot shut down the engine and discharged the fire bottle, but this latter action had no effect on the fire. The pilot then descended to about 10 feet above the water and returned to Vancouver. He declared a Mayday and was cleared by air traffic control for a straight-in approach to runway 12. On the landing roll, the right gear collapsed and the aircraft swerved off the right side of the runway. Emergency vehicles arrived within 30 seconds and immediately extinguished the fire.

Examination of the aircraft revealed that the fire was fed by fuel from the area of the right wing locker tank. The fire burned through the right main gear up lock and down lock mechanisms which permitted the right gear to extend in flight and consequently to collapse on landing. The rear wing spar was burned through while the main spar was partially burned. Except for some heat distortion of the firewall, there was no evidence of fire in the engine nacelle area.

Because of the extent of the damage, the investigators could not determine either the source or the initial location of the fire.

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FINDINGS:

Cause Related:

1. A wing fire occurred in flight.
2. The wing fire damaged the right gear up lock and dock lock mechanisms causing the right gear to extend in flight and consequently to collapse on landing.
3. Neither the source nor the initial location of the fire could be determined.

Other:

- Nil -

06/08/86

BEECH V35B C-GOUF
BRANDON AIRPORT, MANITOBA
16 SEPTEMBER 1984

REPORT NUMBER: 84-C40079 (Accident)
LOCAL TIME: 1650 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	90	52
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot was landing the aircraft on a 2,795-foot hard-surfaced runway with 20 degrees of flap selected. The aircraft touched down in a three-point attitude, bounced into the air, and then landed heavily. The nose gear was torn off, and the aircraft came to rest on the runway 2,000 ft from the threshold.

The aircraft's attitude and airspeed were such that it bounced on landing. Following the bounced landing, control inputs caused the aircraft to porpoise. The nose gear failed because of overload during either the hard landing or the porpoising. A NOTAM had been issued advising users of the runway's rough and cracked condition.

The pilot's medical had expired by two months.

FINDINGS:

Cause Related:

1. The aircraft's attitude and airspeed were such that it bounced on landing.

2. Inappropriate recovery action caused the aircraft to land hard and porpoise.

Other:

1. The pilot's medical had expired.

19/9/85

CESSNA 182 N6477A
ONOWAY, ALBERTA
23 SEPTEMBER 1984

REPORT NUMBER: 84-W40905 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0900 MDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	400	400
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot attempted a take-off from an unprepared field; he had landed there two days earlier because of poor weather. After a take-off run of about 600 feet, the pilot rotated the aircraft, but it would not climb. The aircraft turned left, struck a power line, and fell to the ground. A fire broke out consuming the cockpit and engine area. The pilot was able to exit the aircraft safely.

The investigation revealed that ice and snow had accumulated on the aircraft during its two-day stopover. The pilot had attempted to clear off the ice and snow, but some remained. It was also determined that the take-off area had a two-degree upslope.

The aircraft was modified with a STOL kit, and the pilot assumed that he would obtain good take-off performance. When the aircraft was rotated at the 600-foot mark, adequate flying speed had not been attained. Performance was degraded because of the upslope field conditions and the presence of ice on the aircraft.

FINDINGS:

Cause Related:

1. Performance was degraded because of the upslope field conditions and the presence of ice on the aircraft.

2. The aircraft was allowed to take off before adequate flying speed had been attained.

Other:

- Nil -

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FINDINGS:

Cause related:

1. The aircraft was not adequately cleared of ice and frost from its surfaces.
2. The pilot did not use a proper take-off procedure required for conditions of an upslope with obstructions on departure.

Other:

-- Nil --

CESSNA 188B C-FWWK
MINIOTA, MANITOBA
30 SEPTEMBER 1984

REPORT NUMBER: 84-C40081 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1705 CDT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	359	91
LAST 90 DAYS	63	63

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	

SUMMARY REPORT:

The pilot, who had just landed on his 1800-foot dirt strip, was taxiing back to the parking area when the aircraft swerved to the right. The pilot attempted to control the swing with full left brake and a burst of engine power but was unsuccessful, and the aircraft headed toward several granaries. Engine power was returned to idle and maximum braking was continued. The aircraft nosed over in the soft dirt short of the granaries.

The right wheel was found seized when examined shortly after the accident and could only be turned with difficulty two and one-half hours later. When the brake was disassembled, significant amounts of rust and dirt were found behind the brake pads and on the disc. The components were cleaned and re-assembled, and when tested, the unit operated normally.

Because the available width of hard-packed dirt was only 10 feet and this area was bordered by softer ground, considerable braking was used to maintain directional control on landing and while taxiing. Continuous heavy braking caused excessive heat which could not be dissipated because of the accumulation of rust and dirt; as a result, the right brake seized.

Engine power during ground handling will improve rudder efficiency, but the rate of deceleration is reduced. As a result, there was insufficient distance remaining to stop the aircraft. Maximum braking then had to be applied, and as the aircraft was on a soft surface, it nosed over as elevator control diminished.

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FINDINGS:

Cause Related:

1. Because of the continuous heavy braking and the accumulation of dirt and rust on the brake unit, the right brake overheated and seized.

2. The aircraft swerved to the right onto a soft field bordering the runway.

3. An attempt to use engine power to control the swing resulted in a reduced rate of deceleration.

4. The aircraft nosed over when maximum braking was applied on soft terrain.

Other:

- Nil -

26/07/86

N.A. HARVARD MK IV C-FWWI
RIVIERE QUI BARRE, ALBERTA
30 SEPTEMBER 1984

REPORT NUMBER: 84-W40068 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1420 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	900
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1
OTHERS	-	-	3

SUMMARY REPORT:

The aircraft was on final approach to a private airstrip. The pilot approached the runway at a shallow angle, since steep approaches caused his passenger anxiety. As the aircraft crossed a secondary highway, 90 feet short of the runway threshold, it struck a car that was travelling from right to left. The pilot applied power and initiated an overshoot. The owner of the airstrip informed the pilot by radio that the aircraft had lost its left main gear. The pilot decided to return to Calgary Airport, as the trip would burn off most of the fuel and salvage facilities were more readily available. A successful wheels-up landing was carried out on a runway, with minimal damage to the aircraft.

The car had been struck by the aircraft's left main wheel in an area just behind the front seat. The car travelled into a ditch and came to a stop. The driver, his wife, and their ten-month-old baby sustained minor injuries.

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There were no highway signs posted warning of the possibility of low-flying aircraft.

The short 2,500-foot runway would influence the pilot to touch down near the threshold at minimum landing speed. The pilot did not verify to see if there was traffic on the highway while on final approach and elected to approach at a shallow angle. This action would result in the aircraft having a nose-high attitude, thus making it difficult for the pilot to notice the vehicle as he overflew the highway.

The runway threshold had been positioned relatively close to a public highway; however, no warning signs had been posted to alert drivers to the possibility of low-flying aircraft.

FINDINGS:

Cause Related:

1. The pilot approached the runway at a shallow angle and did not look for traffic on the highway during his final approach.

2. As the aircraft overflew the highway, the car was not observed by the pilot because of the nose-high attitude of the aircraft.

3. The runway threshold was close to a highway.

4. Warning signs regarding low-flying aircraft were not posted on the highway.

Other:

-Nil-

19/08/86

STINSON 108-1 C-FEYB
MARGUERITE, BRITISH COLUMBIA
01 OCTOBER 1984

REPORT NUMBER: 84-P40057 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0950 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	375
LAST 90 DAYS	75	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

During a landing to the north, in calm wind, on a 1,400-by-50-foot grass strip, the aircraft bounced and floated a considerable distance before settling down on runway 34. As the stopping distance appeared marginal, the pilot applied full power and initiated a steep climbing turn to the left. The aircraft cleared the trees bordering the aerodrome, then descended nose-down in an apparent stall. It struck tree-tops, then fell to the forest floor in an inverted position.

The aerodrome, which is privately owned by the pilot, is at an elevation of 2,000 feet above sea level. There is a slight upwards slope to runway 34. It is obstructed on the east side by a power line and by mature trees on the north and west sides. These obstructions are about 10 feet from the strip.

The decision to go around was made after passing the point where the manoeuvre could be safely completed. As a result, in an attempt to clear the trees bordering the runway, the aircraft was made to climb too steeply and it stalled. A recovery could not be completed in time due to the low altitude.

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FINDINGS:

Cause Related:

1. The aircraft stalled during an attempted overshoot after a baulked landing.

2. The decision to go-around was made after passing the point where the manoeuvre could be completed safely.

Other:

-- Nil --

26/07/86

CESSNA 172 C-GRLG
ELK POINT, ALBERTA
01 OCTOBER 1984

REPORT NUMBER: 84-W40069 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1145 MDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	285	285
LAST 90 DAYS	44	44

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot, who was delivering heavy equipment parts to a site near Grande Centre, Alberta, landed the aircraft on a country road. As he taxied to the parking area, the wind blew the aircraft off the left side of the road and into a grove of trees.

At the time of the occurrence, there was a right cross-wind of 35 knots gusting to 50 knots. The pilot's operating handbook states that an average pilot could safely handle a cross-wind component of only 15 knots. The aircraft could not be controlled in these conditions and departed from the narrow landing area.

FINDINGS:

Cause Related:

1. The landing was attempted during unsuitable wind conditions.

Other:

- Nil -

26/07/86

CESSNA 170B N720SD
TAKU RIVER FLATS, BRITISH COLUMBIA
04 OCTOBER 1984

REPORT NUMBER: 84-P40906 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Not Available (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Not Available	Not Available
LAST 90 DAYS	Not Available	Not Available

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was on a pleasure flight from Juneau, Alaska to Taku Flats, British Columbia. Approaching the landing strip, the aircraft descended to a low altitude, and the pilot commenced a low pass in a northerly direction over the strip to check its condition. Just beyond the northern end of the landing area, a loss of control occurred. The aircraft rolled and struck the ground in an inverted position.

The pilot had only a vague recollection of what had happened. Apparently, as the aircraft approached the far end of the landing strip, it stalled for an undetermined reason. As there was insufficient altitude left to recover from the stall, the aircraft struck the ground.

FINDINGS:

Cause Related:

1. The aircraft stalled for an undetermined reason.

Other:

- Nil -

06/08/86

CESSNA 172D CF-OQP
CALGARY, ALBERTA 15 mi SE
8 OCTOBER 1984

REPORT NUMBER: 84-W40070 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1445 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	180	98
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The aircraft had just taken off from a farm strip. As soon as the aircraft became airborne, the pilot realized that there was no roll or pitch control. She raised the flaps and rolled the elevator trim forward, but the aircraft continued to fly toward two 25-foot-high circular steel grain bins to the left of the runway. The left main gear was torn off on impact with the roof of one of the bins, and after flying a further 150 feet, the aircraft struck the ground. The aircraft then collided with a grain swather and a travel trailer, separating both wings from the fuselage before coming to a stop.

A straight rod, with a nut threaded on one end, had been used as a control lock and had not been removed before take-off; consequently the ailerons and elevators were locked. The control lock used was not the standard Cessna single engine control lock, which when installed, locks the ailerons and elevators and covers the master switch, thus preventing an engine start.

FINDINGS:

Cause Related:

1. A non-standard control lock had been installed and had not been removed prior to flight.

Other:

-- Nil --

26/07/86

PIPER PA 28-180 C-GYOO
VIRDEN, MANITOBA 7 mi E
21 OCTOBER 1984

REPORT NUMBER: 84-C40084 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1015 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	251	251
LAST 90 DAYS	48	48

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot and two passengers boarded the aircraft for a local pleasure flight from a private strip near Virden, Manitoba. The strip was 2,000 feet long and bordered at both ends by trees. The surface was soft and was covered with six inches of crested wheat grass and three inches of scrub grass. The pilot selected 10 degrees of flap for take-off, and lift-off was achieved about half-way along the strip at about 72 mph indicated airspeed. The climb-out seemed normal to about 25 feet; but when the pilot retracted the flaps, the aircraft began to settle. Aware that he would not be able to clear the trees ahead, he stalled the aircraft in order to cushion the impact with the trees.

The aircraft manual states: "Take-offs are normally made with flaps up. However, for short field take-offs and for take-offs under difficult conditions such as deep grass or on a soft surface, distances can be reduced appreciably by lowering flaps to 25 degrees." The manual recommends that the best angle of climb speed is 74 mph and the performance figures (maximum effort) show that a take-off run of 720 feet is necessary to clear a 50-foot barrier. These figures are based on a take-off from a paved dry surface.

Under the prevailing conditions, the take-off run and the distance to clear a 50-foot obstacle would have been greater than the published figures, but the exact distances could not be calculated.

FINDINGS:

Cause Related:

1. Once the decision was made to operate under the difficult conditions, the recommended procedures were not used and the aircraft was stalled into trees.

Other:

- Nil -

06/06/86

CESSNA 172 C-FARS
BRUNO, SASKATCHEWAN 3 mi NE
12 NOVEMBER 1984

REPORT NUMBER: 84-C40088 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0120 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	543	543
LAST 90 DAYS	82	82

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was cruising at 11,500 feet above sea level (asl) on a night visual flight rules (VFR) flight from Slave Lake, Alberta to Saskatoon, Saskatchewan. As the aircraft approached Saskatoon, the pilot was informed that the weather conditions had deteriorated there and a VFR approach was not possible. The pilot decided to continue the flight to Regina, as fuel calculations indicated sufficient fuel on board to complete the flight. By that time the pilot had been flying at 11,500 feet asl for over three hours. Approximately 50 miles past Saskatoon, the pilot attempted to contact Regina Radio, but was unsuccessful, and he became unsure of his position relative to Regina. The pilot then decided to descend clear of cloud to determine his position. Approximately 500 feet above ground, he identified the town of Lanigan which is 65 miles east of Saskatoon. Radio contact was established with a military Hercules and vectors were provided to the nearest lighted airport which was Humboldt, Saskatchewan. The pilot flew this vector in low stratus cloud and fog conditions with basically no horizon. The Humboldt Airport was not located and the engine finally stopped because of fuel exhaustion. The pilot carried out a forced landing on a field; the aircraft struck a power line prior to ground impact.

The investigation revealed that although the pilot considered the weather to be suitable for VFR flight, the terminal forecast for Saskatoon showed that below VFR conditions existed for the entire period of the flight. Most of central Saskatchewan was blanketed by low cloud cover and fog, although the system had not yet reached the Regina area. The pilot indicated that he did not trust the weather reporting system and that he thought that the weather would improve east of Saskatoon.

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The investigation was unable to determine the reason for the navigational difficulty after passing Saskatoon. The fact that the pilot had been flying at 11,500 feet for over three hours without any supplementary oxygen may have had some effect on his judgement. Air Navigation Orders state that oxygen is required for all flights exceeding 30 minutes above 10,000 feet asl. The low cloud cover and fog made identification of small towns along the route difficult. Fatigue would be present and when radio contact with Regina was not made, the pilot became confused and decided to descend to determine his position visually.

Five hours after departing Slave Lake, the engine stopped because the fuel supply had been exhausted.

FINDINGS:

Cause Related:

1. The weather was not properly assessed for the route.
2. A VFR flight was continued in conditions requiring radio navigation.
3. The engine stopped due to fuel exhaustion.
4. The aircraft was damaged in a forced landing in a unprepared area.
5. The aircraft was flown above 10,000 feet without supplementary oxygen for more than three hours.

Other:

- Nil -

26/07/86

CESSNA 150L N19567
BOUNDARY BAY AIRPORT, BRITISH COLUMBIA
17 NOVEMBER 1984

REPORT NUMBER: 84-P40908
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	65	60
LAST 90 DAYS	10	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was returning to Bellingham, Washington after a recreational visual flight rules (VFR) flight over Victoria, when he pinpointed his position as over Bayview Airport, 25 miles south of Bellingham. He turned north for Bellingham and approximately five minutes later found himself over Vancouver International Airport. His arrival caused concern in the Vancouver control tower, and he was given a radar vector out of the area to the southeast. In a few minutes, he was back over Boundary Bay, the airfield he had previously mistaken for Bayview Airport. Moments later, at about 2,800 feet above sea level (asl), the engine lost power, and the pilot attempted to carry out a forced landing at Boundary Bay. He circled the airport for a landing towards the east but undershot the approach and landed in a field one-half mile short of the runway. The aircraft nosed-up, and the right wing struck the ground. The aircraft then fell back onto its main gear.

The pilot had visually checked the fuel tanks prior to departure and had estimated the tanks to be half full, an amount sufficient for a two-and one-half-hour flight. However, the tanks were not checked with a dip stick, and therefore the actual amount of fuel on board was not determined.
The tanks were examined after the accident and were found to contain only unusable fuel. Fuel exhaustion had occurred 1 hour and 35 minutes after take-off, indicating that the fuel tanks were less than half full prior to departure.

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DATE: 02/10/86

FINDINGS:

Cause Related:

1. The pilot had overestimated the amount of fuel on board for the flight.

2. The pilot was unaware of his position with respect to his destination.

3. The loss of engine power was due to fuel exhaustion and although the aircraft was within gliding distance of an airport, the pilot misjudged the forced landing and undershot the runway.

Other:

- Nil -

PIPER PA23-250 CF-MTR
GIROUXVILLE, ALBERTA 15 mi S
23 NOVEMBER 1984

REPORT NUMBER: 84-W40077 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0930 MST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	10
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot had departed Edmonton Municipal Airport for a first cross-country flight in his recently purchased, used, light twin aircraft. Approximately half an hour into the flight, the left engine fuel pressure began to fluctuate. The pilot rectified the problem by selecting fuel cross-feed from the right inboard fuel tank. A short time later, the right engine lost power. The right outboard fuel tank was selected on, and the cross-feed was turned off. An unsuccessful right engine restart was attempted with the throttle fully open as required in the check-list. At the same time, the left engine started to lose power, fluctuating down to 1,500 rpm. The pilot elected to secure the right engine and carry out a forced landing on a highway. After touchdown, the left wing struck a road sign, and the aircraft swung into a snow-filled ditch, damaging the left wing, nose gear, and left propeller.

The investigation revealed a number of factors which contributed to the accident. The fluctuating left engine fuel pressure was caused by accumulations of ice which had blocked the fuel lines, filter and drains. It was determined that loose fitting expandable rubber seals on the fuel caps had allowed water to drain into the left fuel tanks. The water had gathered over a long period as the aircraft had been flown rarely during the preceding two years and had been stored outside for most of that time. With the lines, filter, and drains

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blocked, the engine was not receiving adequate fuel supply or pressure from the left tanks. That problem was rectified by using cross-feed; however, this action resulted in a rapid depletion of the right inboard fuel tank and the subsequent right engine power loss. The left engine continued to run using fuel from the left inboard tank, which had not been selected off; however, the left engine resumed fluctuating because of the unrelieved ice blockages.

On inspection, the right engine fuel mixture was found to be too lean, thus accounting for the engine's failure to restart with the throttle fully open and the use of fuel from the right outboard tank. Investigators were able to start the engine with the throttle nearly closed, after which it ran normally.

FINDINGS:

Cause Related:

1. The left engine speed fluctuated because of ice accumulations which blocked the fuel lines, filter and drains.

2. Ice accumulations had formed from water which had leaked through loose fitting fuel caps while the aircraft was stored outside.

3. The right engine lost power due to fuel starvation and could not be restarted using fuel from the right outboard tank because the fuel mixture setting was too lean.

Other:

- Nil -

02/10/86

BEECH V35B C-GOUF
BRANDON AIRPORT, MANITOBA
16 SEPTEMBER 1984

REPORT NUMBER: 84-C40079 (Accident)
LOCAL TIME: 1650 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	90	52
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot was landing the aircraft on a 2,795-foot hard-surfaced runway with 20 degrees of flap selected. The aircraft touched down in a three-point attitude, bounced into the air, and then landed heavily. The nose gear was torn off, and the aircraft came to rest on the runway 2,000 ft from the threshold.

The aircraft's attitude and airspeed were such that it bounced on landing. Following the bounced landing, control inputs caused the aircraft to porpoise. The nose gear failed because of overload during either the hard landing or the porpoising. A NOTAM had been issued advising users of the runway's rough and cracked condition.

The pilot's medical had expired by two months.

FINDINGS:

Cause Related:

1. The aircraft's attitude and airspeed were such that it bounced on landing.

2. Inappropriate recovery action caused the aircraft to land hard and porpoise.

Other:

1. The pilot's medical had expired.

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PIPER PA-18 C-FIBX
HUDSON'S HOPE, BRITISH COLUMBIA
6 JANUARY 1985

REPORT NUMBER: 85-P50001 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1500 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,700	100
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was taxiing at 10 to 15 mph down runway 05 for take-off on runway 23. The wind was from 270 degrees at 15 to 20 mph with gusts. A gust from the northwest caused the aircraft to veer left. The pilot attempted to correct the swing by applying right rudder and power but was unsuccessful and the aircraft left the runway, bounced through snow for about 150 feet until the left wheel hit a large drift and then nosed down. The left wing, the nose, and then the right wing contacted the ground before the aircraft came to rest, upright. The aircraft was not equipped with shoulder harnesses, and the pilot received a minor injury when his head hit the dash.

The pilot did not apply brakes at any time to assist in correcting the swing. As well, the left turn would have been aggravated by the addition of power due to slipstream and torque effects. Proper use of brakes when the uncommanded turn first started and idle power would probably have prevented this accident.

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FINDINGS:

Cause Related:

1. Gusty tail winds caused the aircraft to veer left.
2. The recovery procedures used by the pilot aggravated the turn, increased the taxi speed, and the aircraft left the runway.
3. The aircraft nosed down when the left wheel hit a snow-drift.

Other:

1. A shoulder harness was not installed, and the pilot sustained a minor head injury.

02/10/86

CESSNA 172 C-GWMU
LETHBRIDGE, ALBERTA
23 FEBRUARY 1985

REPORT NUMBER: 85-W50007 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	325	325
LAST 90 DAYS	11	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

As the aircraft was being taxied to take off in a right cross-wind gusting to 40 knots, it encountered a strong gust of wind. The aircraft flipped over causing extensive buckling to the fuselage and damage to the engine and propeller.

FINDINGS:

Cause Related:

1. The aircraft was being taxied in wind conditions which far exceeded the capabilities of the aircraft.

Other:

-Nil-

26/07/86

CESSNA 150F C-FUQN
KIRBY, ONTARIO 4 mi E
27 MARCH 1985

REPORT NUMBER: 85-050023 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1730 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,200	40
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

While returning to Peterborough, Ontario, the pilot encountered deteriorating weather and elected to make a precautionary landing on a farmer's field. On touchdown, the aircraft's wheels sank into the soft turf, and the aircraft nosed over.

Prior to the flight, the pilot received a weather briefing which forecast marginal visual flight rules (VFR) conditions. An approaching warm front was producing lowering ceilings, isolated thunderstorms and restricted visibility in precipitation. In the thunder-showers, ceilings of 500 to 1,500 feet were forecast, with visibilities of three to five miles.

When the pilot encountered weather conditions which precluded further VFR flight, he carried out a precautionary landing to await better weather. Although the approach and touchdown were successful, the soft surface would not support the aircraft's weight. As the wheels sank into the turf, the aircraft decelerated rapidly and flipped onto its back.

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FINDINGS:

Cause Related:

1. The pilot elected to conduct the flight with marginal weather conditions forecasted.
2. The pilot encountered deteriorating weather and carried out a precautionary landing on a farmer's field.
3. The aircraft's wheels sank into the soft surface of the field, causing the aircraft to nose over.

Other:

- Nil -

06/10/86

CESSNA 421C C-GRJP
TORONTO/LESTER B. PEARSON INTERNATIONAL AIRPORT
TORONTO, ONTARIO
3 APRIL 1985

REPORT NUMBER: 85-050024 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0838 EST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,600	600
LAST 90 DAYS	60	55

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	3
OTHER	-	-	1

SUMMARY REPORT:

The aircraft was taxiing southbound on an uncontrolled taxiway, when the left wing was struck by a snowplough which was backing onto the taxiway.

The taxiway at the time of the accident was thinly covered with wet snow and slush.

The snowplough operator thought that aircraft traffic would be coming from his right, and he was looking in that direction. He did not look to his left until his vehicle had entered the taxiway. Because the taxiway was wet and slippery, the snowplough operator was unable to stop his vehicle in time to avoid the collision.

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FINDINGS:

Cause Related:

1. The snowplough operator did not ensure that the taxiway was clear of aircraft traffic.
2. Because of the slippery conditions, the snowplough operator was unable to stop his vehicle in time to avoid the collision.

Other:

- Nil -

03/10/86

BEECHCRAFT B55 C-GWUE
TRENTON, NOVA SCOTIA
12 APRIL 1985

REPORT NUMBER: 85-A50006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1800 AST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	50
LAST 90 DAYS	9	9

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was returning from an ice reconnaissance trip. Before landing, the pilot selected the gear down and received positive confirmation by checking the green indicator light. The aircraft touched down and had rolled approximately 800 feet when the left gear collapsed.

The investigation determined that the left extension/retraction rod had failed during the landing roll. A further examination revealed that the rod, which was original to the aircraft, had been bent prior to the accident flight and was therefore shorter than normal. On the day of the failure, the bent rod lowered the left gear; however, because of the shortened condition of the rod, its throw was not sufficient to allow the down-lock roller to lock into position. Since the gear down-and-locked indicator is triggered by the actuator's ability to turn to its full limit, which it did, the pilot had no means of knowing that the gear was not locked. During the landing roll, the left gear could not sustain any side load and collapsed.

During maintenance or periodic inspections, the seats and floors are removed to check the main gear assembly; the gear assembly rods are exposed at this stage and are susceptible to inadvertent damage. As the rod in question had never been removed from this 26-year old aircraft, the damage to the rod most likely occurred sometime during an inspection or during maintenance. Progressive bending then shortened the rod to the point where it would work the gear leg but not lock it in the down position.

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FINDINGS:

Cause Related:

1. The left main gear assembly rod was bent prior to the occurrence flight.
2. The shortening effect of this bend caused the left landing gear to travel short of the down-locked position.
3. The left gear collapsed during the landing roll.

Other:

1. During maintenance or inspection of the main gear assembly, when the seats and floors are removed, the gear assembly rods are exposed and susceptible to inadvertent damage.

08/10/86

CESSNA 182J C-GXQH
NORTH RUSSELL CREEK, YUKON
17 APRIL 1985

REPORT NUMBER: 85-W50013 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2005 PST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	500
LAST 90 DAYS	37	37

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot, with two passengers and 450 pounds of freight on board, took off on a visual flight rules (VFR) flight from Watson Lake Airport, Yukon, to Tuktoyaktuk, Northwest Territories with a refuelling stop at Dawson City, Yukon. Midway to Dawson City, the flight encountered deteriorating weather. The pilot continued until he was about 75 miles from Dawson City when he was forced to divert to Faro, Yukon. En route to Faro he again ran into poor weather and in an attempt to find improved weather conditions he eventually became lost.

After flying around for some time, the pilot spotted a small snow strip adjacent to a large river. By this time, he had been airborne for over six hours and had very little fuel remaining. He circled over the strip to ensure its suitability and then made a precautionary landing. As the aircraft slowed down during the landing roll, the nosewheel broke through a soft spot in the compacted snow surface, and the aircraft nosed over.

The three occupants had difficulty in vacating the aircraft because the unsecured cargo blocked the exits. One passenger had neither a seat nor a seat-belt.

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Prior to departure from Watson Lake, the pilot had checked the weather and requested information for various stations along the route. Only the aviation weather reports for Dawson City, Inuvik and Tuktoyaktuk were available and all were above VFR limits. The area forecast showed that a trough of warm air aloft (TROWAL) was moving through the area and was parallel and just ahead of the planned route. The air mass behind the TROWAL was unstable with frequent snow flurries. As the TROWAL moved further to the east, the air mass became more unstable and the flurries more frequent. An en route weather briefing was not requested.

The investigation also revealed that the rear seats and seat-belts had been removed leaving only the two front seats available for the pilot and one passenger. The second passenger sat unrestrained on the unsecured cargo. The aircraft was overloaded by approximately 400 pounds on departure from Watson Lake.

FINDINGS:

Cause-Related:

1. The pilot had not requested an adequate weather briefing.

2. Adverse weather was encountered during the flight.

3. When the pilot continued the flight in adverse weather, he became lost.

4. During a precautionary landing on a compacted snow surface, the nosewheel broke through the surface, and the aircraft nosed over.

Other:

1. One of the passengers was unrestrained.

2. Because the cargo was not secured, it shifted and hampered the evacuation.

3. The aircraft was overloaded by about 400 pounds on departure.

06/08/86

CESSNA 180 CF-ILB
LUNDAR, MANITOBA 2 mi NW
19 APRIL 1985

REPORT NUMBER: 85-C50018 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2030 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,900	1,800
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot departed on an intended two-hour and twenty-five minute cross-country flight. Approximately 25 miles short of the planned destination, the pilot decided to divert to an airstrip nearby because of thunderstorm activity ahead and approaching darkness. While the aircraft was downwind for a landing at the alternate airport, the engine lost power. A forced landing was carried out on a field which was bordered by a drainage ditch. The landing was without incident; however, in order to avoid contact with the ditch, the pilot purposely bounced his aircraft back into the air. The right-hand gear leg contacted the far side of the ditch, and the leg broke off resulting in extensive wing and propeller damage.

The investigation revealed that there was no fuel in either of the gas tanks. The pilot had completed a pre-flight walkaround; however, he did not physically check the gas tanks for fuel. He had filled the tanks to capacity after his last flight on 13 April 1985 and assumed that they were still full. Although the pilot noticed that the gauges were reading low, he assumed that this was due to faulty gauges; the gauges were known to be unreliable at times.

FINDINGS:

Cause Related:

1. The loss of engine power was due to fuel exhaustion.

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2. The pilot refuelled the aircraft to capacity five days prior to the flight; however, he did not remove the gas caps to check the fuel quantity during his pre-flight walkaround.

3. The reason for the fuel deficiency could not be determined.

Other:

- Nil -

02/10/86

CESSNA T210L C-GCVM
OTTAWA INTERNATIONAL AIRPORT, ONTARIO
23 JUNE 1985

REPORT NUMBER: 85-050047 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1724 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	350	274
LAST 90 DAYS	24	24

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	1	1

SUMMARY REPORT:

On approach, the landing gear was selected down, but it did not extend. All attempts by the pilot to lower the gear with the normal system and with the emergency hand pump were unsuccessful. The pilot carried out a wheels-up landing on the grass, on the north side of runway 22.

An examination of the landing gear power pack revealed blue metal chips in the fluid reservoir. One of the chips had jammed the slide valve, thus preventing it from moving. As a result, the gear extension ports were blocked, and the power pack was prevented from extending the landing gear. The origin of the chips could not be determined.

The following laboratory report was completed: LP 155/85 - Hydraulic Power Pack - Cessna T210L, C-GCVM.

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FINDINGS:

Cause Related:

1. The landing gear hydraulic system became unserviceable because of metal contamination in the hydraulic power pack.

Other:

- Nil -

03/10/86

CESSNA U206F C-GWVT
FORT SMITH, NORTHWEST TERRITORIES 20 mi W
17 JULY 1985

REPORT NUMBER: 85-W50039 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1530 MDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,700	50
LAST 90 DAYS	250	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing his recently purchased aircraft on the 35-foot-wide gravel road near his family's construction camp. On touchdown, the aircraft bounced and settled on its nose. The nose gear collapsed and the aircraft slid into a roadside drainage ditch.

Evidence indicates that the aircraft touched down heavily in a nose-down attitude, causing the nose gear strut to fail just above the fork. Although the pilot was very experienced on helicopters, he had little experience on fixed-wing aircraft. Due to the pilot's lack of experience on this type of airplane, the aircraft attitude was misjudged.

FINDINGS:

Cause-Related:

1. The aircraft landed heavily in a nose-down attitude causing the nose gear strut to fail just above the fork.

Other:

- Nil -

DATE: 02/10/86

BELLANCA 8GCBC N86901
EAGLE, ALASKA 35 mi NE
21 AUGUST 1985

REPORT NUMBER: 85-W50905 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1900 YDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	248	157
LAST 90 DAYS	21	21

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Shortly after departure from a mountainside hunting camp, the aircraft engine began to sputter. A precautionary landing was attempted on a mountain bench, but the aircraft overshot the intended landing area. The pilot applied power for a go-around, but the aircraft struck the side of an adjacent ravine.

The intended landing area was 5,000 feet above sea level, and the pilot reported the temperature and dew point to be seven and four degrees Celsius respectively. The approach was carried out with a 10-to-15 knot tail wind.

The investigation, which included a post-accident engine test run (Lycoming O-360-C2A), failed to reveal any technical faults which could have contributed to the engine malfunction. If the temperature and dew point, as reported by the pilot, were accurate, then the pilot could have expected carburettor icing in climb and cruise power, and this may have caused the engine malfunction. Although the tail wind contributed to the aircraft overshooting the intended landing area, the mountainous terrain likely left the pilot with little choice in his selection of a landing area.

FINDINGS:

Cause Related:

1. The engine malfunctioned during flight for undetermined reasons.

Other:

- Nil -

02/10/86

CESSNA 175 C-GHJP
NAMPA, ALBERTA 9 mi E
2 OCTOBER 1985

REPORT NUMBER: 85-W50053 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1400 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,000	400
LAST 90 DAYS	85	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot taxied onto the grass field and continued rolling for take-off. The wind was from the right at 15 gusting to 25 knots, and flaps were selected to 20 degrees. The aircraft lifted off at 50 mph and accelerated to 55 to 60 mph. As the aircraft climbed, the airspeed suddenly dropped to 45 mph, and the aircraft stalled and rolled to the left. As the pilot attempted to recover by easing the aircraft nose down, the left gear struck the ground. The aircraft slid across a small ditch, the nose gear broke off, and the aircraft nosed over.

The aircraft took off in ground effect at an airspeed very near the stall speed and accelerated to approximately 5 to 10 mph above stall speed. A combination of the aircraft coming out of ground effect and the gusty wind conditions reduced the airspeed below the stall, and the pilot lost control of the aircraft.

FINDINGS:

Cause Related:

1. The pilot attempted to take off at an airspeed which was too low considering the gusty wind conditions, and the aircraft stalled.

Other:

- Nil -

02/10/86

AERONCA 7DC C-FYQM
BAGOTVILLE, QUEBEC 112 mi SSE
01 OCTOBER 1983

REPORT NUMBER: 83-Q30069 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1800 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	483	41
LAST 90 DAYS	31	31

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

While cruising at 300 to 400 feet above ground level in marginal weather, the aircraft engine (Continental C-85-12F) coughed and backfired. Although the pilot applied carburettor heat and increased the power, the engine rpm continued to drop, and the engine stopped. The pilot decided to carry out a forced landing on a small lake; however, the aircraft struck the trees short of the intended landing area and crashed.

The ambient conditions were conducive to carburettor icing. Although the pilot suspected carburettor icing and applied carburettor heat, the engine stopped. It could not be determined if carburettor icing was a factor in the loss of engine power.

A successful forced landing was not possible because the aircraft was cruising at an altitude that was too low to ensure that the selected landing area could be reached.

FINDINGS:

Cause Related:

1. The aircraft engine stopped for undetermined reasons.

2. The cruising altitude was too low to allow a successful forced landing.

Other:

-- Nil --

19/11/85

PIPER PA-18 C-GEBN
NESTOR FALLS, ONTARIO 20 mi SE
4 APRIL 1984

REPORT NUMBER: 84-C44011 (Incident)
LOCAL TIME: 0945 CST
OPERATION: Private Company Business
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	960	150
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing on an ice-covered lake in a ski-equipped aircraft. The aircraft overran the landing area and came to rest at the shoreline. One ski was broken, and the leading edge of one wing was slightly damaged when the aircraft collided with brush and stumps.

Due to the effect of temperature fluctuations, ice conditions are difficult to assess from the air. At the time of the occurrence, the wind was calm, and the temperature was near 0 degrees C which made the surface slick. The landing distance required was underestimated. With no head wind and a slippery surface, the ski-equipped aircraft could not be stopped in the available distance.

FINDINGS:

Cause Related:

1. The landing distance required for the ambient conditions was underestimated.

Other:

-- Nil --

19/09/85

CESSNA A185F   C-GZTT
COOK'S CREEK, MANITOBA
28 JUNE 1984

REPORT NUMBER: 84-C40041 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1530 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,100	600
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot loaded the aircraft with fishing supplies (weight unknown) and took off from a small creek. The temperature was 25 degrees Celsius with a headwind of 5 to 10 knots. After becoming airborne, the aircraft did not climb rapidly enough, and the floats struck the creek bank 20 feet above the surface of the water, 15 feet below the top of the bank. The aircraft bounced over the bank, slid through a wheat field and nosed over, coming to rest 370 feet from the initial impact point.

The investigation failed to reveal any pre-crash aircraft malfunctions or failures. It was reported that the aircraft was below maximum allowable weight and within centre of gravity limits. The pilot had taken off from this area many times; the run available was normally sufficient to allow the aircraft to easily clear the creek bank. The evidence suggests that heavy aircraft weight combined with the relatively high temperature reduced the climb performance of the aircraft to the extent it was not able to clear the bank.

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17/09/86

84-C40041

FINDINGS:

Cause Related:

1. With the existing conditions of aircraft weight and outside temperature, the rate of climb of the aircraft was not sufficient to allow it to clear the creek bank.

Other:

-Nil-

17/09/86

PIPER PA-18S CF-HSY
MARGIE LAKE, BRITISH COLUMBIA
19 JULY 1984

REPORT NUMBER: 84-P40031 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0740 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	1,000
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilot and one passenger took off towards the east from Margie Lake, 6,000 feet above sea level, on a flight to Revelstoke, British Columbia. The aircraft, which was at near maximum gross weight, lifted off the water and climbed normally; however, over the eastern edge of the lake, while climbing through about 60 feet above the surface, the aircraft suddenly dropped 15 to 20 feet. The right wing struck the top of a tree; the aircraft yawed and rolled to the right and descended in a near vertical attitude into deep snow. It came to rest in an inverted position. The passenger's seat-belt failed during the crash.

The investigation did not reveal any pre-crash aircraft malfunction or failure. The weather was clear with the wind calm to five mph from the west, and the temperature was eight to ten degrees Celsius.

Mountains border the take-off area to the north and south with rising terrain westward and descending terrain eastward. It is

.../2

17/09/86

believed the aircraft entered an area of downdraft which caused the uncontrollable altitude loss. The aircraft was near maximum weight at a relatively high density altitude which adversely affected the power available to counteract the effect of the sudden downdraft.

Laboratory testing of the failed seat-belt revealed evidence of degradation of the physical characteristics of the belt material; however, meaningful quantitative assessment of the actual degree of strength loss could not be made due to the short length of material available for testing.

The following laboratory report was completed: LP 256/84 - Seat-Belt Failure.

FINDINGS:

Cause Related:

1. The aircraft dropped suddenly after take-off and contacted trees on the departure path.
2. The aircraft entered an area of downdraft, the strength of which exceeded the climb performance of the aircraft.
3. The passenger seat-belt failed during the crash, which may have aggravated the passenger's injuries.

Other:

-Nil-

17/09/86

PIPER PA14 CF-HQN
FORT ST. JOHN, BRITISH COLUMBIA 7.6 mi W
19 JULY 1984

REPORT NUMBER: 84-P40032 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1400 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,000	200
LAST 90 DAYS	30	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot intended to inspect a lake situated in a mountain valley and to land the float-equipped aircraft there if the lake was suitable. To do so, he planned to overfly the possible landing site then follow the valley south to where he could turn around. After carrying out the inspection, he started out of the valley; however, after crossing a steep ridge, he encountered a downdraft. The aircraft started to lose altitude and even with the engine at full power, the pilot could not arrest the descent. Unable to turn in the narrow valley, the pilot elected to carry out a forced landing in a relatively clear area ahead. Just prior to touchdown, the aircraft's right wing struck a tree, causing the aircraft to spin around and crash.

After crossing the ridge, the aircraft was about 500 feet above the ground and in a valley whose west wall rises almost vertically for 1,500 feet. The prevailing wind was from the west and was spilling down this west wall into the north-south valley. The velocity of the downdraft exceeded the climb capability of the aircraft. The pilot had not considered the possibility of encountering a downdraft of that magnitude prior to entering the valley.

FINDINGS:

Cause Related:

1. The pilot encountered a downdraft that exceeded the aircraft's climb capability.

2. The pilot had not considered the possibility of encountering a downdraft of that magnitude prior to entering the valley.

Other:

- Nil -

02/10/86

CESSNA 185 C-FNGN
ESPANOLA EAST AERODROME, ONTARIO
13 AUGUST 1984

REPORT NUMBER: 84-040056 (Accident)
INFORMATION SOUCE: Field Investigation
LOCAL TIME: 2030 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	199	70
LAST 90 DAYS	120	32

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

On arrival over the Espanola East Aerodrome, the pilot of the amphibious aircraft circled overhead twice to check the runway and then made his approach to runway 08. The aircraft touched down 400 feet beyond the threshold. The runway surface was rough and sandy, and the pilot had difficulty controlling the aircraft. As the aircraft slowed, the left float bounced over a clump of grass, and as the castering float nosewheel struck the ground, the wheel strut broke. The strut then dug into the soft sandy surface of the runway, and the aircraft nosed over.

The visual flight rules (VFR) supplement, in use at the time of the accident, described the Espanola East Aerodrome as an unlicensed aerodrome which is unattended on weekdays. A cautionary note stated that the sand runway surface was soft. The operator's name and telephone number were listed; however, the pilot did not call the operator to check the condition of the runway before planning his flight.

At the time of the accident, the pictorial description of the aerodrome in the VFR supplement was incorrect. The supplement indicated that the runway was 75 feet wide and 2,200 feet long, with the threshold displaced 500 feet. Encroaching bushes, grass clumps, and drifting sand had reduced the runway so that it measured 35 feet in width and 2,000 feet in length. The runway was marked by fluorescent red road-marker cones. Once a year, the Department of Transport (DOT) writes to operators of aerodromes listed in the supplement requesting an update on the status of the aerodromes. No amendment to the status of Espanola East Aerodrome had been received.

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06/08/86

CITABRIA 7GCBC C-GWGH
LITTLE GULL LAKE, ONTARIO
03 FEBRUARY 1985

REPORT NUMBER: 85-C50008 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1430 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	643	70
LAST 90 DAYS	35	9

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ski-equipped aircraft was landing on a small snow-covered lake which was surrounded by high terrain. Shortly after touchdown, the pilot realized that he could not stop before the shoreline and that he had insufficient space to carry out an overshoot. He decided to ground loop the aircraft. During this manoeuvre, the right ski dug into the snow, the ski axle failed, and the aircraft was substantially damaged.

The local terrain features around the lake altered the wind direction to the extent that the aircraft landed with a tail wind component. As a result of this surface wind condition, there was insufficient landing distance available on the lake surface. The pilot recognized this fact too late to permit an overshoot, and, during the attempted ground loop, excessive load was put on the axle of the right ski causing it to fail.

FINDINGS:

Cause Related:

1. The lake selected by the pilot did not provide sufficient landing distance considering the surface wind conditions.

2. The ski axle failed because of overload during the attempted ground loop.

Other:

- Nil -

02/10/86

CESSNA 180H C-GDVA
SUDBURY, ONTARIO 40 mi NW
09 MARCH 1985

REPORT NUMBER: 85-050014 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1130 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	469	69
LAST 90 DAYS	17	17

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot, accompanied by two passengers, was on a short flight from one lake to another. The destination lake was about 2,500 feet long, S-shaped, and varied in width from 500 to 800 feet. The lake, oriented in a north/south direction, was surrounded by hills, with the tallest hill on the west side. The approach was made from the north, and as the ski-equipped aircraft touched down on the frozen lake, a gust of wind raised the right wing. The left wing dropped and touched the ice surface, causing the aircraft to nose over.

The pilot reported that the wind was from the southwest and was gusting from 25 to 30 knots. Because of the surrounding hills, the winds were variable during the approach and landing.

FINDINGS:

Cause Related:

1. During the landing, a gust of wind caused the left wing to drop.

2. The wing drop was not controlled and the wing touched the ice causing the aircraft to nose over.

Other:

- Nil -

06/08/86

PIPER PA-18S SUPER CUB C-FKRS
LAKE ABITIBI, QUEBEC
10 MARCH 1985

REPORT NUMBER: 85-Q50006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1430 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	200
LAST 90 DAYS	7	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot had decided to land his ski-equipped aircraft near a group of ice fishermen on Lake Abitibi. He set up his landing pattern to enable him to land in a set of tracks made by another aircraft. There was a light cross-wind from the left. During the final turn at approximately 100 feet above ground level, and with the throttle at idle, the pilot realized he was going to overshoot his intended landing path. He increased his bank angle to 60 degrees, applied back pressure on the control column, and the aircraft pitched nose down. The pilot attempted to roll the wings level, while still maintaining back pressure on the controls. The aircraft crashed left-wing-down in a steep, nose-down attitude, seriously injuring the pilot.

The aircraft's weight at the time of the crash was approximately 270 pounds above the maximum allowable take-off weight. The pilot's medical had expired the previous month.

The investigation determined that the aircraft stalled in a steep turn. The light cross-wind from the left would have contributed to the aircraft overshooting the intended landing path during the

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final turn. In order to correct for this overshoot, a steeper final turn would have been required. As the pilot was already at low altitude when he commenced the final turn, he was committed to making a level turn. A level 60-degree bank turn at low engine power would inevitably produce a stall. Once the aircraft stalled, the pilot maintained back pressure on the controls and thus perpetuated the stall.

FINDINGS:

Cause Related:

1. The pilot induced a stall while attempting a steep turn at low altitude.
2. The pilot's continued application of control back pressure prevented recovery from the stall.

Other:

1. The aircraft weight exceeded the maximum allowable by about 270 pounds.
2. The pilot's licence was invalid because his medical had expired.

26/03/87

CESSNA A185F C-GQIP
HORSESHOE LAKE, ONTARIO
11 OCTOBER 1985

REPORT NUMBER: 85-050083 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1905 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,576	2,500
LAST 90 DAYS	130	122

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of an amphibious float-equipped aircraft took off from Parry Sound Airport with the intention of doing a land circuit. He changed his mind while climbing to circuit altitude and diverted to Horseshoe Lake to practise a water landing. On touchdown, the aircraft nosed over in the water. The landing gear was in the extended position on touchdown.

The pilot did not retract the landing gear after the take-off and did not confirm that the landing gear was retracted prior to the water landing. The extended landing gear caused the aircraft to nose over on contact with the water.

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03/10/86

85-050033

FINDINGS:

Cause Related:

1. The pilot did not confirm that the landing gear was retracted prior to landing on water.

Other:

- Nil -

03/10/86

PROVINCE OF NEW BRUNSWICK
BEECH BARON E-55 C-FAZI
ST. LEONARD, NEW BRUNSWICK
16 NOVEMBER 1984

REPORT NUMBER: 84-A40027 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1710 AST
OPERATION: State
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,200	3,000
LAST 90 DAYS	100	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was engaged in a passenger carrying instrument flight rules (IFR) flight from Fredericton, New Brunswick to St. Leonard, New Brunswick. On arrival, the pilot cancelled the IFR flight plan and proceeded with a visual approach. At this point, the pilot was interrupted by a radio transmission while he was attempting to complete the pre-landing check. As the aircraft touched down, the propellers contacted the runway. The pilot, realizing that the landing gear was not down, closed the throttles and landed on the aircraft fuselage.

During the pre-landing check sequence, the pilot was distracted by a radio call; as a result, he did not complete the pre-landing check by selecting the landing gear down.

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29/09/86

84-A40027

FINDINGS:

Cause Related:

1. The pilot was distracted and did not complete the pre-landing check by selecting the landing gear down.

Other:

- Nil -

29/09/86

DEPARTMENT OF TRANSPORT
DOUGLAS C47A C-FCUE
FORT MCMURRAY, ALBERTA
23 JANUARY 1986

REPORT NUMBER: 86-H60003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1112 MST
OPERATION: State
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

	PILOT-IN-COMMAND		CO-PILOT	
PILOT HOURS:	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	4,500	454	9,514	435
LAST 90 DAYS	26	4	32	32

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

While the aircraft was holding short of the runway, the co-pilot noticed that the landing gear hydraulic pressure had decreased. He released the landing gear down latch and pulled up on the landing gear selector. The right landing gear retracted, and the right side of the aircraft settled onto the ground. The right propeller struck the ground and separated from the engine.

The co-pilot had intended to re-establish the hydraulic pressure in the landing gear system by reselecting the gear lever to the down position. Instead, he inadvertently selected the gear up, which resulted in the retraction of the right gear.

The selector valve in the landing gear system for this type of aircraft will allow hydraulic fluid to bypass the valve, particularly in older aircraft and in cold temperatures; as a result, the landing gear hydraulic pressure tends to drop during normal operations. It is common practice to ensure that hydraulic pressure is maintained whether the gear is up or down. The crew had just completed a flight from Edmonton to Fort McMurray, during which time, the hydraulic pressure necessary to keep the gear selected up could not be maintained, and the crew was required to repeatedly position the selector up. Inattention and the repeated gear-up selections while airborne probably had some bearing on the co-pilot's inadvertent selection while on the ground.

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02/10/86

FINDINGS:

Cause Related:

1. Following a flight where the gear was repeatedly selected up, the co-pilot selected the gear up while the aircraft was on the ground.

Other:

1. The selector valve in the landing gear hydraulic system in this aircraft will allow hydraulic fluid to bypass the valve and cause a drop in system pressure.

02/10/86

SECTION II

ROTARY WING AIRCRAFT

YUKON AIRWAYS LTD.
HILLER UH12E, C-FOKQ
KLUKSHU VILLAGE, YUKON 5 MI SW
28 AUGUST 1983

REPORT NUMBER: 83-W30045 (Accident)
LOCAL TIME: 0900 YST
OPERATION: Charter
DAMAGE: Destroyed
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2060	700
LAST 90 DAYS	175	160

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot attempted to unload a passenger while hovering, with the skid just touching the side of a steeply sloped hill. The main rotor struck the side of the hill and the helicopter slid down the hill and burned. The passenger was thrown clear when the blades struck the ground. The pilot was able to exit the aircraft quickly, with assistance, when it came to rest.

The pilot felt he initially had 2 or 3 feet rotor clearance, but then diverted his attention from the rotor to skid position to ensure safe passenger deplaning. At that point the rotor blades struck the hillside.

Investigation revealed that with a skid touching a hill, the maximum slope to provide zero rotor blade clearance is 40 deg. The slope at the accident site was approximately 35 to 40 degrees because of outcroppings.

FINDINGS:

Cause Related:

1. The main rotor of the helicopter struck the side of a hill during the unloading of a passenger.

2. An attempt was made to hover in a position which allowed minimum rotor blade clearance from sloping terrain.

Other:

- Nil -

DATE: 09/05/85

GLACIER HELICOPTERS
HUGHES 369D (Helicopter) C-GLOG
EDDONTENAJON, BRITISH COLUMBIA 50 mi SE
15 APRIL 1984

REPORT NUMBER: 84-P40008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0725 PST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,000	3,500
LAST 90 DAYS	58	51

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The helicopter with a pilot and four passengers departed Eddontenajon, British Columbia on a visual flight rules (VFR) flight to a drilling rig 65 miles to the southeast. About 50 miles en route, at 300 feet above ground level and at 100 knots, the helicopter yawed slightly, and the engine-out light and horn activated. The automatic engine relight functioned immediately, and engine indications quickly returned to normal. The pilot decided to land and check the engine. He initiated a normal approach to a suitable landing area; however, he soon realized the engine was not producing adequate power. The helicopter landed hard, short of the intended landing area, and came to rest upright. The engine was running at ground idle after impact and could not be shut down using cockpit controls; the engine was shut down using controls at the fuel control unit.

The weather was overcast clouds at 500 feet above ground level, visibility was one mile in light snow, and the wind was calm, with the temperature near freezing.

.../2

02/10/86

The investigation failed to reveal any reason for the initial engine (Allison 250-C20B) power loss or the subsequent lack of power. Immediately after the landing, the engine intake areas were confirmed to be free of ice and snow. The engine could not be shut down normally, because the controls were damaged during the hard landing.

FINDINGS:

Cause Related:

1. The engine lost power for undetermined reasons.

Other:

-Nil-

02/10/86

RANGER HELICOPTERS CANADA
ROBINSON R22 C-GCSU
PARTRIDGE POINT, ONTARIO
23 AUGUST 1984

REPORT NUMBER: 84-040059 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1335 EDT
OPERATION: Speciality Flying Training
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,200	850
LAST 90 DAYS	150	70

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

During a dual training flight, the student was performing a rapid deceleration which had been demonstrated to him by the instructor. While in the flare, the rotor rpm was allowed to decay below the lower operating limit. The instructor took control, but with the combination of low altitude and low airspeed, he could not regain enough rotor rpm to maintain flight. The helicopter settled in the water with the rotor blades in an over-pitched condition.

Cause Related:

1. During a low level manoeuver, the main rotor rpm was allowed to decay below the operating limits.

2. The instructor did not take control in sufficient time to prevent the loss of control which was due to low rotor rpm.

Other:

-- Nil --

19/09/85

ZIMMER TRAVEL AND AIR SERVICES LIMITED
SIKORSKY S-55B (Helicopter) C-GGRK
LAMBTON COUNTY, ONTARIO (42°38' N, 83°25' W)
17 SEPTEMBER 1984

REPORT NUMBER: 84-040077 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: Unknown
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,600	165
LAST 90 DAYS	165	165

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter was preparing for take-off with a load of wheat seed on board. As the pilot applied collective pitch, two of the empty fibre seed bags on top of a nearby truck blew up on to one of the main rotor blades. The aircraft began to vibrate, and the pilot immediately shut the engine down. As the rotor slowed, one blade drooped and struck the tail boom severing the tail rotor drive shaft.

The drag, which was created by the bags, forced a rotor blade out of phase with the other blades and caused the aircraft to vibrate. This vibration may have prevented the droop stop from locking into the position which normally prevents the blade from striking the tail.

FINDINGS:

Cause Related:

1. When the pilot applied collective pitch for take-off, two empty bags blew up on to one main rotor blade.

2. The droop stop did not lock into position.

3. The blade drooped and struck the tail boom.

Other:

-- Nil --

16/10/85

WOODLAND HELICOPTERS LTD.
BELL 206B (Helicopter) C-GNMF
NITINAT LAKE, BRITISH COLUMBIA
13 DECEMBER 1984

REPORT NUMBER: 84-P40063 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1030 PST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,800	2,000
LAST 90 DAYS	273	273

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter was being used to sling cedar blocks out of the woods to the end of a logging road a short distance away. As the tenth load of the morning was being picked up, the helicopter's engine (Allison 250-C20) stopped, and the pilot made a forced landing on some old tree stumps.

Investigation did not reveal the cause of the engine stoppage. The engine started normally and was run to idle power in the damaged airframe a few days after the accident. The fuel control, governor, pump and nozzle were serviceable when bench checked, and there was adequate fuel available. The helicopter was damaged on landing because there was no clear landing area available.

The following laboratory report was completed: LP 76/85 - Fuel Sample Analysis.

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FINDINGS:

Cause Related:

1. The engine stopped for undetermined reasons.
2. The aircraft was damaged during the forced landing when the aircraft was landed on tree stumps.

Other:

-Nil-

07/11/86

HUGHES 369D (Helicopter) C-GZGX
UPTON POINT, KINGCOME INLET, BRITISH COLUMBIA
07 MAY 1985

REPORT NUMBER: 85-P50012 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1340 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,000	Unknown
LAST 90 DAYS	197	97

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter was in cruise flight over open water at approximately 700 feet above sea level, when the pilot heard a loud noise from the rear of the aircraft. Immediately, the aircraft pitched down slightly and yawed to the left. The airspeed decreased rapidly, and the helicopter began rotating quickly to the right. The pilot was unable to regain directional control, and the helicopter landed heavily in the water. The pilot exited through the windshield which had broken on impact, and he was rescued by the occupants of a nearby fishing boat. The aircraft sank and was not recovered.

The helicopter was being flown with the rear doors removed and the rear seats installed. The back of the left rear seat had become detached and was swept out of the aircraft through the rear door opening. The seat back struck the tail rotor, separating the tail rotor gear box from the tail boom, and, as a result, directional control was lost.

The seat back legs fit snuggly into holes in the seat frame and there are no devices that positively lock the seat back in place. As the helicopter sank in deep water and was not recovered, the reason the seat back became detached was not determined.

FINDINGS:

Cause Related:

1. The helicopter was being flown with the rear doors removed and the rear seats installed.

2. The back of the left rear seat became detached for undetermined reasons and was swept out of the aircraft.

3. Directional control of the helicopter was lost when the seat back struck the tail rotor, separating the tail rotor gear box from the tail boom.

Other:

- Nil -

02/10/86

BELL 206L-1 (Helicopter) N3211R
HOPEDALE, LABRADOR, NEWFOUNDLAND 6 mi N
23 MAY 1985

REPORT NUMBER: 85-A50901 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1150 NDT
OPERATION: Private Training
DAMAGE: Destroyed
PILOT LICENCE: Private Rotorcraft (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	900
LAST 90 DAYS	100	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot departed Hopedale, Labrador to carry out a weather check, hoping to continue the flight to Narssarssuag, Greenland, the next stop on his transatlantic flight. The weather was unsuitable for the planned flight, so the pilot decided to practise a couple of forward speed landings on the snow-covered sea ice. On the first landing attempt, the helicopter struck the surface unexpectedly and hard. The main rotor blades flexed downwards, severed the tail boom, and struck the upper windscreen area. The main rotor then broke loose from the transmission. The helicopter skidded 150 feet forward, turned 90 degrees to the left, and rolled over onto its right side. The windscreen, lower chin bubble, yaw pedals and the instrument console were torn free, and the engine and transmission broke loose from their mounts. The skids left 18-inch deep and 25-foot long grooves in the hard-packed snow.

The area that the pilot selected for practising the landings was a featureless frozen bay; the nearest land that could have been used as a reference for touchdown was located at least one-half mile away.

The pilot reported that the cloud ceiling was 300 to 500 feet above ground level with the visibility three to five miles in light drizzle. This weather was confirmed by another pilot who was flying in the area. The combination of overcast cloud and the large featureless expanse of snow created a condition, commonly known as "whiteout", which made it very difficult to accurately estimate the height above the terrain. The pilot had never flown in a winter environment and was not familiar with this phenomenon.

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08/10/86

The investigation concluded that, because of the whiteout conditions, the pilot inadvertently permitted the helicopter to contact the surface while in a high rate of descent.

FINDINGS:

Cause-Related:

1. The helicopter struck the surface while in a high rate of descent.
2. The high rate of descent was not noticed because of the whiteout conditions.
3. The pilot had not flown in a winter environment and was unfamiliar with whiteout conditions.

Other:

- Nil -

08/10/86

SECTION III

OTHER TYPES

BIRDMAN ENTERPRISES ATLAS (Ultralight)
EDMONTON, ALBERTA
18 APRIL 1983

REPORT NUMBER: 83-W35005 (Accident)
LOCAL TIME: 1930 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Not required by regulation at the time

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	25	25
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

ring the approach to a field, the ultralight struck some power lines and ropped to the ground.

The field was bounded by two sets of power lines, one running parallel to the approach path, the other across it. During the approach, the power lines crossing the approach path were partially concealed by a row of trees. The pilot, who was unfamiliar with the field, was concentrating on the power lines parallel to the aircraft, the trees, and the touchdown area. As a result, he did not see the power lines ahead. The kingpost, the ultralight's main structural support post, caught the power lines, and the aircraft fell to the ground.

FINDINGS:

Cause Related:

1. The pilot did not see the power lines which were strung across his approach path.

Other:

— Nil --

19/09/85

SKYSEEKER MK III (Ultralight) Registration not required at the time
OKANAGAN LAKE, BRITISH COLUMBIA
13 JUNE 1983

REPORT NUMBER: 83-P35006 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 PDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	250	-
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

A private pilot, with no prior ultralight experience, requested a check-out on a float-equipped Skyseeker MK III from a rental firm operating on Okanagan Lake. As he was a licensed pilot, no instruction other than a walkaround was deemed necessary. Following a normal take-off and climb to 250 feet, the pilot noticed a significant reduction in propeller efficiency. Manipulation of the throttle control did not rectify the situation, and when the aircraft descended to 100 feet, the pilot prepared for a forced landing. The pilot was unsuccessful in his attempt to manoeuvre the aircraft into wind, and stalled at 25 feet above the lake. The aircraft hit the water and sank in an inverted position. The pilot was wearing a life jacket and was able to escape unharmed.

An examination determined that the internal cogs on the propeller drive belt had stripped resulting in extreme slippage in the drive system between the engine and the propeller. If the pilot had received some ultralight flight instructions prior to solo flight, he would have been better prepared for the possibility of a forced landing. Transport Canada regulations which came into effect 1 July 1983 require training prior to solo flight on ultralight aircraft.

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FINDINGS:

Cause Related:

1. The engine could not provide power to the propeller because the belt-drive cogs were stripped.
2. The aircraft stalled during a forced landing.
3. The pilot had received no ultralight instruction prior to the solo flight.

Other:

- Nil -

21/11/85

BIRDMAN ENTERPRISES, CHINOOK WT-11 (Ultralight) C-IBGQ
BRAGG CREEK, ALBERTA 5 mi NE
20 AUGUST 1983

REPORT NUMBER: 83-W35015 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0730 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	65	1
LAST 90 DAYS	6	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight took off from an unprepared field surrounded by power lines and trees. Shortly after take-off, the pilot felt that the engine (Rotax-277) was not producing the power that he expected, and the climb performance was poor. He turned back to land on the departure field but was not confident that the aircraft would be able to clear a power line, so he attempted to land on a barley field. The right wing touched first and spun the aircraft around. Substantial damage resulted.

The investigation failed to reveal any reason for the apparent power loss. Certain factors such as the pilot's weight, saturation of the aircraft with dew, and premature lift-off from the unprepared field may have degraded the aircraft's performance. The exact cause of the accident could not be determined.

FINDINGS:

Cause Related:

1. The aircraft's performance was degraded for undetermined reasons.

Other:

- Nil -

06/08/86

FINDINGS:

Cause Related:

1. The pilot did not receive dual in-flight instruction on this type of aircraft and was unfamiliar with its performance and control system.
2. The aircraft lifted-off early to avoid holes in the field, and failed to climb as a result of the lower than normal airspeed.

Other:

- Nil -

AMERICAN EAGLE (Ultralight) C-IFLZ
YARROW, BRITISH COLUMBIA
26 OCTOBER 1983

REPORT NUMBER: 83-P35015 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1312 PDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	86	76
LAST 90 DAYS	61	61

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

A student pilot was receiving flight instruction in a two-seater ultralight trainer. While on final approach for a landing, the instructor indicated to the student that the power should be reduced. When the student retarded the throttle to idle, the aircraft began to descend rapidly. The student raised the nose, but the aircraft continued its high sink rate. The instructor assumed control and lowered the nose, but was unable to reach the throttle control. The aircraft struck the ground before recovery was possible.

Communication between the instructor and the student in an open cockpit environment consists of shouting and hand signals. In this occurrence, the student misunderstood the instruction to reduce power, and he closed the throttle. On this ultralight, the control column is located between the seats, allowing use by either occupant. However, the throttle control is positioned on the outboard side of the left seat (student's) and is not accessible to the instructor.

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21/11/85

FINDINGS:

Cause Related:

1. The student misunderstood the instruction to reduce power and fully closed the throttle resulting in a high sink rate.
2. The instructor was unable to reach the throttle control because it was on the opposite side of the aircraft.
3. Because the instructor was unable to add power the high sink rate could not be stopped.

Other:

-- Nil --

21/11/85

EIPPER QUICKSILVER MX (Ultralight) C-IBHS
WHITE RIVER, ONTARIO 12 mi E
4 JULY 1984

REPORT NUMBER: 84-045012 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1630 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	38	38
LAST 90 DAYS	34	34

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight aircraft was cruising at about 700 feet above a highway on one of the legs of a cross-country flight. Suddenly, the engine (Cuyuna 32 HP) sputtered, then stopped. As there was no suitable landing site within reach, the pilot force-landed the aircraft in a stand of trees.

The overhaul facility that examined the engine found that the snap ring which holds the main jet metering needle in position was weak and had dislodged from its groove. As a result of this condition, the needle was allowed to drop into the jet, where it blocked the fuel supply to the engine.

FINDINGS:

Cause Related:

1. A weak snap ring became dislodged inside the carburettor and allowed the metering needle to fall into the main jet.

2. The metering needle blocked the fuel supply to the engine, and the engine lost all power.

3. Because of the loss of power, a forced landing had to be carried out on unsuitable terrain.

4. The aircraft sustained substantial damage when it force-landed into a stand of trees.

Other:

- Nil -

26/06/86

GOLDWING (Ultralight) C-IFCQ
MALVERN, ONTARIO
08 JULY 1984

REPORT NUMBER: 84-045013 (Accident)
LOCAL TIME: 1400 EDT
OPERATION: Private (Test)
DAMAGE: Substantial
PILOT LICENCE: NIL

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The owner was taxiing to test the landing gear, when the ultralight became airborne. While the aircraft was circling to land, the engine (Cuyuna 440) stopped. The owner carried out a forced landing on a corn field; the ultralight was damaged on contact with the ground.

The owner had not reported the accident in accordance with regulations. The local police, who were notified of the accident by an engineer on a CNR yard engine, reported the occurrence.

When the investigators arrived at the scene, the engine had been removed from the ultralight. As a result, the cause of the loss of engine power could not be determined.

The owner did not hold any pilot's licence nor was there any record of his flying time. It became mandatory to hold a licence to fly an ultralight on 1 July 1984.

FINDINGS:

Cause Related:

1. The owner, who was not a licensed pilot, was taxiing his ultralight when it became airborne.

2. As the ultralight was circling to land, the engine stopped for undetermined reasons.

3. The ultralight was damaged during a forced landing.

... /2

DATE: 18/03/86

Other:

1. The owner had no record of any flying time.
2. The accident had not been reported by the owner.

QUICKIE #1 (Amateur-built) C-GRFK
PITT MEADOWS, BRITISH COLUMBIA
10 JULY 1984

REPORT NUMBER: 84-P44011 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 757 PDT
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	250	120
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was on base leg for runway 26L in preparation for a landing, when the engine stopped. All attempts to restart the engine failed, and the pilot decided to carry out a forced landing. The aircraft touched down approximately 300 feet short of the runway in tall grass and soft soil. After a ground roll of about 27 feet, it nosed over.

The investigation revealed that the spark plugs were covered with soot. The evidence suggests that an incorrect fuel/oil mixture was used causing a malfunction of the ignition and engine spark plug firing system, which led to the power loss.

FINDINGS:

Cause Related:

1. The loss of engine power was probably due to the use of an incorrect fuel/oil mixture.

Other:

- Nil -

06/08/86

LAZAIR SERIES III (Ultralight) C-IGFZ
CRESCENT BEACH, BRITISH COLUMBIA
10 JULY 1984

REPORT NUMBER: 84-P45005 (Accident)
LOCAL TIME: 1230 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	80	55
LAST 90 DAYS	40	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As the pilot flew his ultralight aircraft over a nearby beach, he decided to conduct an impromptu airshow for the benefit of a crowd of sunbathers. He looped the aircraft and then made a left wing-over followed by a right wing-over. During the recovery from the right wing-over, the aileron control could not be moved, and the ultralight spiralled down and crashed into the water. The ultralight came to rest floating in a level attitude supported by the wing. The pilot was uninjured and was able to swim to shore.

While the aircraft was out of control, the pilot noticed that the control push rod to the right aileron, which runs up the trailing edge of the right strut and is supported by three nylon bushings, was bowed between the centre and lower bushing. Contrary to regulations, the ultralight was disassembled and removed from the scene before it could be inspected, but the evidence indicates that the aircraft structure was distorted during the aerobatics, causing the aileron push rod to bind.

FINDINGS:

Cause Related:

1. Aerobatics were being performed in the ultralight aircraft.
2. The loads applied to the structure distorted the airframe which caused the aileron push rod to bind, and roll control was lost.

Other:

1. Contrary to regulations, the aircraft was disassembled and removed from the scene before it could be inspected.

18/03/86

LAZAIR (Ultralight) C-IDPQ
TOTTENHAM-VOLKS FIELD, ONTARIO
12 JULY 1984

REPORT NUMBER: 84-045014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1115 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	16	3
LAST 90 DAYS	.1	.1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was attempting his first take-off of the year on this ultralight. The wind was blowing down the runway at 10 knots gusting to 15. Shortly after take-off, at a height of approximately 25 feet, the pilot lost control of the aircraft, and it made a 360-degree left turn with the nose pitching up and down. The aircraft then descended, struck the ground and nosed over.

Examination of the wreckage did not reveal any structural failure or control malfunction which would have contributed to the accident. The pilot's overall flying experience was low and he had flown the Lazair on only one previous flight; that flight had ended in a loss-of-control accident.

The manufacturer's literature on the Lazair notes that the aircraft is very sensitive in pitch control. This sensitivity, combined with gusty wind conditions, would have made the aircraft difficult for the inexperienced pilot to control. He was unable to stop the pitch oscillations which began shortly after take-off.

.../2

06/08/86

FINDINGS:

Cause Related:

1 The pilot's flying experience was low and he had not flown for several months.

2. Aircraft sensitivity in pitch control, combined with wind conditions, contributed to the pilot being unable to maintain control of the ultralight.

Other:

- Nil -

06/08/86

TERATORN, TIERRA II (Ultralight) C-IDUL
BEAVER LAKE, ONTARIO
4 AUGUST 1984

REPORT NUMBER: 84-045018 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1130 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	280	174
LAST 90 DAYS	174	174

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The float-equipped ultralight took off from Beaver Lake and climbed to about 30 ft. The aircraft suddenly descended and struck the water in a nose-down attitude.

At the time of the accident the wind was light and variable. The ultralight was climbing at about 45 mph, well above the stall speed. As there were no reported mechanical discrepancies with the ultralight, it is likely that a downdraft, resulting from thermal activity near the lake, caused the steep uncontrolled descent.

FINDINGS:

Cause Related

1. The cause of the accident is undetermined; however, it is possible that the pilot flew into a downdraft which exceeded the climb capability of the ultralight.

Other

- Nil -

3/10/85

MUSTANG 11 (Amateur-built) C-G1Z1
BRANTFORD AIRPORT, ONTARIO
11 AUGUST 1984

REPORT NUMBER: 84-040054 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0940 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	1
LAST 90 DAYS	16	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot rounded out high for the touchdown. The tailwheel aircraft stalled; the left wing dropped and struck the runway. The pilot attempted to correct by the application of rudder, but the aircraft swerved and landed heavily on the grass beside the runway.

On this landing, the aircraft was rounded out high and allowed to stall. In the stall, the aircraft yawed as the wing dropped and the use of the rudder was ineffective in maintaining directional control. The heavy landing caused the main landing gear to collapse.

The investigation determined that the pilot had flown all of his hours on tricycle landing gear aircraft. With only 30 minutes of flight time and one previous landing on the Mustang, the pilot was not familiar with the flight characteristics and operation of this tail wheel aircraft.

FINDINGS:

Cause Related:

1. The aircraft was rounded out high and stalled.
2. The wing dropped, and the main landing gear collapsed when the aircraft struck the ground.
3. Most of the pilot's flying experience was on tricycle landing gear aircraft.

Other:

- Nil -

3/10/85

AX8 FIREFLY (Balloon) C-GTHR
OKATOKS, ALBERTA 1 mi S
11 AUGUST 1984

REPORT NUMBER: 84-W40060 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0930 MDT
OPERATION: Private Recreational
DAMAGE: None
PILOT LICENCE: Free Balloon

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	412	412
LAST 90 DAYS	37	37

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	2	2

SUMMARY REPORT:

The pilot with four passengers on board the hot air balloon was on a recreational flight in the Calgary area. The wind was light and variable and was forecast to remain this way for the duration of the flight. As the flight progressed, the wind began to increase, and the pilot decided to land as soon as a suitable field was available. Approximately 50 feet above the ground, the pilot encountered a wind shear that increased the balloon's rate of descent and resulted in a heavy landing. The basket was dragged for 100 yards before coming to a stop. Two of the passengers suffered broken ankles on impact.

The investigation revealed that there was a minor cold front with an associated wind of 20 knots passing through the Calgary area. The pilot was not informed about the presence of this front during the pre-flight weather briefing. When the pilot encountered the wind shear, she applied full burner but was unable to stop the high rate of descent.

FINDINGS:

Cause Related:

1. The pilot was unaware of a cold front in the area of the flight.
2. The wind speed increased during the flight from light and variable to an estimated 20 knots.
3. Because of the low altitude, the application of full burner was ineffective in arresting the high rate of descent.

Other:

-Nil-

17/09/86

BREEZEY RLU-1 (Amateur-built) C-GFUB
NOBLETON, ONTARIO 1 mi S
12 AUGUST 1984

REPORT NUMBER: 84-040055 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1335 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	11
LAST 90 DAYS	Unknown	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The solo pilot was on a local pleasure flight in the amateur-built aircraft. He had just completed a touch-and-go landing on a private grass airstrip and then made a climbing right-hand turn to level off at between 100 and 200 feet above ground. Spectators on the ground observed the aircraft enter another right turn, then pitch nose down and plunge to the ground.

The investigation could find no mechanical defect which would account for the sudden plunge to the ground. The elevator was found to be badly deformed in the wreckage and it underwent detailed laboratory examination. This analysis concluded that the elevator damage had resulted from ground impact. The wreckage pattern and impact damage were consistent with a low-altitude stall or spin.

The human factors investigation found no evidence that incapacitation, physiological or psychological factors affected the pilot's performance. The Breezey aircraft has an open design fuselage with no structure over, beside, or directly ahead of the pilot. Manoeuvring and speed control can be difficult on this type of aircraft because of a lack of good attitude references from the open cockpit. According to the evidence, the airspeed was allowed to decrease to stalling speed during the low-altitude turn. The aircraft then entered a stall or incipient spin at too low an altitude to recover.

The following laboratory reports were completed: LP 271/84 - Elevator Evaluation and LP 272/84 - Analysis of Instruments.

FINDINGS:

Cause Related:

1. The aircraft was allowed to stall at an altitude too low for recovery.

Other:

-Nil-

06/08/86

TERATORN TIERRA II (Ultralight) C-IFDJ
COCHRANE, ONTARIO 4 mi S
25 AUGUST 1984

REPORT NUMBER: 84-045020 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1956 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight, Private Aeroplane

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	94	22
LAST 90 DAYS	22	22

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the ultralight aircraft took off for a demonstration flight from a grass airstrip. The take-off and climb-out were carried out downwind with full flaps. At about 100 feet into the climb-out, the aircraft began a turn to the right, stalled, and lost altitude. The right wing hit a power line around which the aircraft pivoted before striking the ground in a nose-down attitude.

The investigation revealed that the pilot took off downwind, although a take-off into wind could have been performed. In the turn at low altitude, the aircraft was flying too slowly and stalled. Because of the low altitude at which the stall occurred, the recovery could not be performed before the aircraft hit the power line.

Since no Certificate of Airworthiness is required by the Air Regulations for ultralight aircraft, there is accordingly no approved aircraft flight manual describing the use and effect of flaps. Based upon his private pilot background, the pilot selected flaps on the ultralight in order to shorten the take-off roll. In fact, the flaps on this aircraft are intended to be used to increase the rate of descent and have no marked effect on take-off performance. According to the designer, the flaps-down configuration on this aircraft increases the susceptibility of the wings to stalling in a turn.

The downwind take-off produced a flattened climb angle and a higher ground speed. The low altitude and high ground speed would have given the pilot the impression that he had attained a higher airspeed than he actually had. These effects are particularly exaggerated in ultralights because of their low operating speeds.

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06/08/86

FINDINGS:

Cause Related:

1. The aircraft took off downwind with full flaps.
2. The tail wind gave the pilot the illusion of having a higher airspeed than he actually had.
3. The slow flying aircraft stalled in a turn at low altitude and struck a power line.
4. The use of full flaps contributed to the wing's stalling in the turn.

Other:

1. The Air Regulations do not require approved aircraft flight manuals for ultralight aircraft.

06/08/86

BIRDMAN CHINOOK WT-11 (Ultralight) C-IAHL
HALIFAX, NOVA SCOTIA
26 AUGUST 1984

REPORT NUMBER: 84-A45004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1045 ADT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	70	20
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight aircraft was in level cruise at an altitude of 300 to 500 feet. The pilot began a turn to the left, and the ultralight suddenly pitched down and dove into the ground. The aircraft burst into flames, and the pilot was killed on impact.

Six days prior to the accident, while driving home from work, the pilot had a dizzy spell which forced him to stop the car and rest for one hour before proceeding. He did not consult a doctor but remained home from work the next day and returned to work the following day. Three days prior to the accident, the pilot's son was involved in a serious motorcycle accident and was in hospital listed in critical condition. The evenings of 23 and 24 August 1984 were spent at the hospital with his son who was in intensive care.

Although the investigation revealed that the elevator and rudder horns were attached to the torque tubes with AD64B5 aluminium rivets instead of the prescribed AN3-28 steel bolts, there was no evidence of an in-flight structural failure.

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29/09/86

Although the autopsy did not reveal any signs of pilot incapacitation, the fact that the pilot had recently experienced a dizzy spell combined with the stress associated with his son's accident suggests possible incapacitation of some sort.

The following laboratory report was completed: LP 312/84 - Coils and Condenser Evaluation.

FINDINGS:

Cause Related:

1. For undetermined reasons, the pilot lost control of the aircraft in flight.

Other:

1. The elevator and rudder horns were attached to their torque tubes with aluminium rivets instead of the steel bolts called for in the construction plans.
2. The pilot experienced a severe dizzy spell six days prior to the accident.
3. The pilot was experiencing stress as a result of his son's recent motorcycle accident.

29/09/86

HOVEY DELTA BIRD (Ultralight) C-IAIM
TITUSVILLE, NEW BRUNSWICK
11 OCTOBER 1984

REPORT NUMBER: 84-A45007 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1000 AST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7	5
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight pilot took off in a westerly direction from a private airstrip behind his house to practise circuits. He continued around the circuit for a low approach and overshoot on the easterly runway. There is pronounced upsloping terrain along and at the eastern end of the airstrip, with numerous trees just off the runway end. The approach was made close to the ground, and, on the overshoot, the pilot realized that the aircraft would be unable to clear the large trees directly off the end of the runway. He turned the aircraft to the right toward an area of smaller trees; however, he was unable to clear them, and the aircraft struck the trees and crashed.

The pilot had minimal flying experience and did not possess an ultralight pilot licence or student pilot permit as required by regulations.

The pilot either flew too low on the low approach or delayed his overshoot to the extent that the aircraft was unable to clear the

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terrain obstacles at the end of the runway. As the runway was located behind the pilot's house and as he had just taken off on this same runway, the pilot was probably well aware of the terrain features and could have planned his approach and overshoot accordingly. The easterly runway is unsuitable for both take-off and landing because of the upslope of the runway surface and terrain features at the end.

FINDINGS:

Cause Related:

1. The pilot was operating from an airstrip which was unsuitable for the operation of the ultralight.
2. The pilot executed an overshoot from low altitude, without due consideration to the sharply rising terrain ahead.

Other:

1. The pilot did not possess an ultralight pilot licence or student pilot permit as required by regulations.

29/09/86

BIRDMAN CHINOOK WTII (Ultralight) C-IDOY
ALLISTON, ONTARIO 3 mi E
24 OCTOBER 1984

REPORT NUMBER: 84-045023 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1100 EST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	16	.5
LAST 90 DAYS	9	.5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The privately owned ultralight was being used for solo flight training on the day of the accident. The student pilot took off from a grass strip to fly a circuit, while the instructor monitored the flight from the ground. The student overflew the runway on the first circuit. On the final approach of the second circuit, the ultralight pitched nose down from 100 to 150 feet above ground level and struck the ground in a near vertical nose-down attitude.

The sky was clear, the visibility unlimited, and the wind was calm. Before allowing the student to go solo, the instructor had flown several circuits to determine the flight conditions. He did not encounter any turbulence in the circuit.

The student pilot had received about 15 hours of dual instruction in a Thor ultralight. He had flown the Chinook ultralight once before, on a 15-minute solo flight, more than 30 days prior to the accident. His last dual flight had been 20 days before the accident.

.../2

The fabric on the upper and lower surfaces of the horizontal stabilizer of the Chinook ultralight is attached at the leading edge by adhesive tape, and the seam is covered by a plastic covering tape. The covering tape on the right horizontal stabilizer of the accident ultralight was torn, and the upper surface fabric had pulled away from the leading edge in several places. Some or all of the plastic tape covering the leading edges had been mended or replaced during previous repairs. It could not be determined what effect the fabric separation would have had on the controllability of the ultralight if the separation had occurred in flight. The investigation also revealed that the plastic cap fitting at the outboard end of the right leading edge support tube had been incorrectly installed. Both the plastic cap installation and the taping of the covering fabric were not in accordance with the manufacturer's assembly instructions.

There was a lack of continuity in the student's flying training. At his experience level, a dual flight with an instructor may have been prudent prior to going solo after 20 days of flying inactivity.

FINDINGS:

Cause Related:

1. The ultralight pitched nose down and crashed on final approach for undetermined reasons.

Other:

1. The construction and repair of the horizontal stabilizer were not in accordance with the manufacturer's assembly instructions.
2. The student pilot did not have a dual flight with an instructor prior to the solo flight.

06/10/86

PIETENPOL SKY SCOUT (Amateur-built) C-GGFY
SAULT STE. MARIE, ONTARIO
29 APRIL 1985

REPORT NUMBER: 85-050028 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2036 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	160	11
LAST 90 DAYS	6	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was flying circuits from a private airstrip, and on the downwind leg of the second circuit, the engine began to run rough. The pilot decided to carry out a precautionary landing on a farm field directly ahead of him. On final approach, the engine stopped, and the aircraft touched down on the upslope of a knoll. The main landing gear collapsed, and the aircraft nosed over.

Prior to this flight, the amateur-built aircraft had been in winter storage for several months. Before storing the aircraft for the winter, the pilot had had trouble with a leaking carburettor float bowl gasket. At that time, he repaired the leaky gasket with silicone sealer; however, a bead of silicone formed inside the bowl when the carburettor was reassembled. Over the long winter period, pieces of the silicone broke off and became lodged in the carburettor's main jets, eventually blocking the fuel flow to the engine.

When the engine began to run rough, the pilot did not want to risk trying to complete a full circuit and instead decided to

.../2

land straight ahead. When the engine stopped, the pilot was unable to make the selected landing area and was forced to land on the upslope of a knoll. The landing impact caused the main gear struts to fail in overload.

FINDINGS:

Cause Related:

1. An incompatible sealer, used to repair the carburettor, contaminated the carburettor bowl and blocked the flow of fuel to the engine causing it to run rough.

2. The pilot made an emergency landing in a farm field resulting in the overload failure of the main gear struts.

Other:

-Nil-

06/10/86

OSPREY II (Amateur-built) C-GSMP
SAINT JOHN AIRPORT, SAINT JOHN, NEW BRUNSWICK
04 JUNE 1985

REPORT NUMBER: 85-A50013 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1925 ADT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	.3
LAST 90 DAYS	1	.3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had just commenced a series of test flights on his newly constructed aircraft. The tests consisted of take-offs, short flights above the runway, and landings. On the third take-off, the aircraft veered to the right, lost height in a side-slip, and the right main gear struck the runway. The aircraft bounced back into the air, and the pilot was able to regain control. A landing was carried out straight ahead on the runway, and on touchdown, the right main gear collapsed. The aircraft settled on the keel and the right sponson.

The investigation revealed that the aircraft veered to the right because of an excessive use of right rudder; however, when the pilot tried to correct, the aircraft did not respond. The pilot then realized that his left foot was pushing against a vertical rib instead of the rudder pedal. When the pilot did regain control, the right main gear had already contacted the runway. The vertical rib was located two inches aft of the left rudder pedal and caught the pilot's foot as it moved forward. The square design of the rib also made it possible for the foot to catch on the forward side of the vertical rib, thus preventing aft movement of the rudder pedal. The investigation further revealed that when the right main gear struck the runway, the gear actuating rod end stub failed in overload at the walking beam. The failure then permitted the right main gear to collapse.

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06/08/86

FINDINGS:

Cause Related:

1. The pilot momentarily lost control of the aircraft after lift-off because his left foot had caught against a vertical rib adjacent to the left rudder pedal.
2. The landing gear actuating rod failed when the gear contacted the runway, thus permitting the right main gear to collapse.

Other:

- Nil -

06/08/86

ZENITH CH200 (Amateur-built) C-GBZX
WATERLOO-WELLINGTON AIRPORT, ONTARIO
15 NOVEMBER 1985

REPORT NUMBER: 85-050090 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0813 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,600	60
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

While attempting to land on runway 07, the aircraft landed hard, and the main landing gear collapsed.

The investigation revealed that the pilot initiated the flare too high above the runway. He failed to take appropriate corrective action and allowed the aircraft to stall. There was insufficient height in which to effect a recovery from the stall.

FINDINGS:

Cause Related:

1. When the aircraft was flared too high above the runway, the pilot failed to take appropriate corrective action and allowed the aircraft to stall during the landing attempt.

Other:

- Nil -

03/10/86

AVIATION SAFETY RECOMMENDATIONS

AVIATION SAFETY RECOMMENDATIONS

ADOPTED IN 1987 AND ISSUED AS OF 31 JULY 87

OCCURRENCE	SUBJECT	RECOMMENDATION
Boeing 737-200 Calgary International Airport, Alberta, 22 March 1984	Quality Control-Engine Overhaul Procedures	The Department of Transport take the necessary steps to ensure that critical Pratt & Whitney JT8D engine components fully comply with manufacturer's specifications during reassembly at any overhaul facility. CASB 87-01
	Response to Emergencies - Air Traffic Services	The Department of Transport revise its training syllabus, procedures, and Air Traffic Control Manual of Operations (MANOPS) to require that air traffic services personnel take immediate action to inform the pilots of an aircraft of any observed condition that may adversely affect that aircraft's safety, such as a fire. CASB 87-02
	Response to Emergencies - Cockpit/Cabin Crew	The Department of Transport require that aircraft-on-the-ground emergency procedures and training emphasize the need to stop an aircraft immediately and determine the nature of the emergency; CASB 87-03
		The Department of Transport require that emergency procedures and training incorporate coordinated responses by the total crew complement; and CASB 87-04

AVIATION SAFETY RECOMMENDATIONS

ADOPTED IN 1987 AND ISSUED AS OF 31 JULY 87

OCCURRENCE	SUBJECT	RECOMMENDATION
		The Department of Transport require that transport category aircraft have a means for the cabin crew to alert the cockpit crew directly and immediately of any critical on-board emergency. CASB 87-05
	Emergency Fire Procedure	The Department of Transport require that emergency procedures be implemented for those fires which do not immediately activate on-board fire or smoke detection systems. CASB 87-06
	Uncontained Engine Component Hazard	The Department of Transport review current aircraft design criteria with the long-term objective of reducing or eliminating the hazard of uncontained engine components compromising the airworthiness of the aircraft. CASB 87-07
	Airport Disaster Plan - Control of Survivors	The Department of Transport revise its Standards for Plans and Procedures for Airport Emergencies to ensure that the control of survivors of on-the-field aircraft accidents is sufficient to enable the timely and accurate compilation of survivor lists and details as to where survivors can be located. CASB 87-08

AVIATION SAFETY RECOMMENDATIONS

ADOPTED IN 1987 AND ISSUED AS OF 31 JULY 87

OCCURRENCE	SUBJECT	RECOMMENDATION
	Airport Diasaster Plan - Protection of Aircraft Wreckage	The Department of Transport revise its Standards for Plans and Procedures for Airport Emergencies to take into account section 7 of the CASB Regulations and require authorization by the CASB investigator-in-charge prior to the accident runway being cleared and returned to operational service. CASB 87-09
Aerospatiale AS 332L Super Puma, St. John's Airport, Newfoundland, 27 April 1985	Automatic Flight Control System (AFCS) - Force-Links Failures	The Department of Transport establish a requirement for a schedule of mandatory inspection for AS 332L Super Puma AFCS force-links. CASB 87-10
Beechcraft 65-90 King Air Lachute Airport, Quebec, 29 August 1985	Qualification Standards - Pilot-In-Command.	The Department of Transport establish, by aircraft type, minimal levels of experience on type for upgrading Transport Canada flight crew to the position of pilot-in-command. CASB 87-11
Beechcraft D 18-S Schefferville, Quebec, 30 September 1985	Misuses of Medication by Flight Crew	The Department of Transport expand its program of information dissemination pertaining to the hazards of inappropriate use of medication while flying. CASB 87-12

AVIATION SAFETY RECOMMENDATIONS

ADOPTED IN 1987 AND ISSUED AS OF 31 JULY 87

OCCURRENCE	SUBJECT	RECOMMENDATION
	Transport Canada Surveillance - Suspension of an Operating Certificate	The Department of Transport amend their procedures to ensure that in every case in which an air carrier's operating certificate is cancelled or suspended by Transport Canada, the officials within the department most capable of detecting a continuation of commercial operations be notified in a timely manner. CASB 87-13
	Transport Canada Surveillance - Flight Service Station Specialists Training	The Department of Transport develop and implement a training program designed to enhance the capability of flight services station specialists to detect violations of the Air Regulations and Air Navigation Orders. CASB 87-14
McDonnell Douglas DC-3 Pickle Lake, Ontario, 11 May 1987	Audit of X-Ray Inspections	The Department of Transport initiate an immediate and complete audit of the NDT inspections, regardless of aircraft type, conducted by the company which carried out the recent x-ray inspections of the DC-3 aircraft, registration C-FADD. CASB 87-15

ANNEX 1

"AVIATION OCCURRENCE REPORTS" ISSUES 1 AND 2 - ERRATA:

Included in the AVIATION OCCURRENCE REPORTS, ISSUE #1 AND ISSUE #2, were six draft or conditional reports. Two reports, 85-030045 and 84-040802, which appeared in ISSUE #1, contain some changes and have been reproduced in this ISSUE in their final approved form. The other reports 83-P35004, 83-P35005, 83-C40051, and 84-C44027 remain as originally published.

AIRCRAFT ACCIDENT

SKYCRAFT AIR TRANSPORT INC.
DOUGLAS DC-3, C-GUBT
TORONTO INTERNATIONAL AIRPORT
22 JUNE 1983

REPORT NUMBER 83-030045

SYNOPSIS

The accident was investigated by the Aviation Safety Bureau of Transport Canada; the report was reviewed and issued by the Canadian Aviation Safety Board.

The aircraft was flying from Cleveland to Toronto International Airport, on the third leg of a trans-border cargo flight.

When approaching to land at Toronto, and after crossing the runway threshold, the aircraft entered a series of pitch oscillations, then stalled and struck the ground beside the runway in a flat attitude. A fire followed. Both crew members perished in the crash.

The aircraft's weight and centre of gravity limits were exceeded, and the cargo was not secured. These factors led to loss of control of the aircraft.

3.0 CONCLUSIONS

3.1 Cause-Related Findings

1. The weight of the cargo, as displayed in manifests and associated documents, was understated by approximately 4400 lbs.

2. The flight crew accepted the documented cargo weight.

3. The load and its distribution resulted in the gross weight and centre of gravity exceeding the specified limits.

4. The load was not secured prior to departure from Cleveland.

5. A centre of gravity beyond the aft limit resulted in longitudinal instability such that a pitch change on approach at Toronto initiated a series of oscillations that become uncontrollable.

6. The unrestrained load moved rearward during the oscillations, making recovery impossible.

3.2 Other Findings

1. The flight crew was certified and qualified for the flight in accordance with regulations.

2. The aircraft was certified, equipped and maintained in accordance with regulations and approved procedures.

3. There was no evidence of any system failure or aircraft malfunction prior to, or during the flight.

4. It could not be determined whether the crew calculated the weight and balance prior to departure from Cleveland.

5. The first officer had been on duty for 19 hours prior to the accident.

4.0 RECOMMENDATIONS

4.1 The "Cause-Related" and "Other" findings in this accident identified a number of areas that are addressed by the following recommendations which have been adopted by the Canadian Aviation Safety Board.

The Canadian Aviation Safety Board recommends that Transport Canada:

1. Issue a notice to carriers emphasizing the importance to safety, of correct weights of goods/loads accepted for air shipment and compliance with aircraft weight and balance requirements.
2. Review its audit system to ensure emphasis on the areas of aircraft weight and balance and security of cargo. (CASB-85-02)

COLLISION BETWEEN: BEECHCRAFT C-35 C-FKHV and
CESSNA 152 C-GQSY
BRAMPTON AIRPORT, BRAMPTON, ONTARIO
28 APRIL 1984

LOCAL TIME: 1230 EST
INFORMATION SOURCE: Field Investigation

BEECHCRAFT C-35 C-FKHV

REPORT NUMBER: 84-040801 (Accident)
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE. Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	219	104
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

CESSNA 152 C-GQSY

REPORT NUMBER: 84-040802 (Accident)
OPERATOR: Brampton Flying Club
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	47	47
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The Beech Bonanza and the Cessna 152 collided on Brampton Airport's runway 32 where it intersects the parallel taxiway for runway 26.

The Bonanza had departed from runway 32 for a local visual flight rules flight. On return to the airport, the pilot joined the traffic pattern and followed another aircraft while making his approach to the same runway. Just after touchdown, the left wing tip struck the Cessna 152 which had stopped near the runway edge.

.../2

The Cessna had been taxiing to runway 32 for take-off when area traffic was advised that the wind had shifted to favour runway 26. As the pilot began taxiing across runway 32, he noticed the Bonanza landing. Although he stopped, he was occupying the runway and the Bonanza's left wing struck the Cessna and damaged the nose cowl and left wing.

Investigation revealed that the Cessna pilot had heard the runway change broadcast on UNICOM frequency, but that the Bonanza pilot had not. The Bonanza pilot continued his approach to runway 32. Although he had seen the Cessna taxiing towards runway 32 during his circuit, he did not notice the aircraft again until after the collision.

In order to reach runway 26, the Cessna pilot had to cross runway 32. He had not heard any radio transmission from the Bonanza and did not see the Bonanza on approach to runway 32 until he had begun to cross the runway. He then stopped but was unable to avoid the collision.

The Bonanza's transmissions were not heard by the Cessna and the Bonanza in turn may not have been receiving some transmissions. Brampton is an uncontrolled airport, however, and operations by NORDO aircraft were permissible and common.

Section 529 of the Air Regulations states, "Where an aircraft is in flight or manoeuvring on the ground or water, the pilot-in-command shall give way to other aircraft landing or about to land".

FINDINGS:

Caused Related:

1. The Cessna pilot began to cross runway 32 when the Bonanza was about to land.

2. Neither pilot saw the other aircraft in time to avoid the collision.

Other:

-- Nil --

03/04/86

ANNEX 2

LIST OF REPORTS BY AIRCRAFT MANUFACTURER AND TYPE

REPORT BY AIRCRAFT MANUFACTURER AND TYPE

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
AERONCA	7	Q30069	156
AMERICAN	EAGLE	P35015	194
BEECH	200	W40014	083
	35	C40079	118
		O40801	090
	55	A40027	170
	95	A50006	145
BELL	206	A50901	185
		P40063	182
BELLANCA	7ECA	C50008	164
		W40048	105
	SCOUT	W50905	154
BIRDMAN	ATLAS	W35005	189
	CHINOO	A45004	209
		O45023	213
		W35015	192
BOEING	707300	A44901	050
	727200	O40903	006
	737200	O54025	009
BUSHBY	M11	O40054	204
CESSNA	150	O40042	035
		O40064	037
		O40079	137
		O40804	031
		O50002	040
		O50023	141
		P40801	087
		P40908	133
		W40043	099
	152	C50011	042
		O50087	045
		W30035	048
	170	P40906	128
		Q40032	095
	172	C40073	027
		C40088	131
		O40037	034
		W40046	103
		W40053	108
		W40069	127
		W40070	129
		W50007	140
		W50010	068
	175	W50053	155

MANUFACTURER	TYPE	REPORT NUMBER	PAGE (con't)
Cessna	180	C40043	054
		C50018	149
		O50014	165
		Q40011	085
	182	C40080	036
		C40906	016
		W40905	119
		W50013	147
	185	A40024	018
		C40041	158
		C40089	024
		C40092	025
		O40056	163
		O50034	069
		O50083	168
	188	C40040	053
		C40081	121
		W30028	046
	206	C40074	110
		C44013	015
		W50039	153
	210	O50047	151
		P34029	074
		P44003	093
	305	P40042	109
	310	A44006	081
		W40006	079
	421	O50024	143
		P40905	116
CHAMPION	7GCB	W40041	097
DEHAVND CAN	DHC2	A50001	065
		C40094	061
	DHC6	H30007	011
		H40005	056
DOUGLAS	DC1010	C34901	003
	DC3	H60003	172
	DC9 30	O44016	005
EIPPER	QKSILV	O45012	196
FIREFLY	FF8	W40060	205
GOLDWING	GOLDWI	O45013	197
GRUMMANAMER	AA5	C44016	092
HILLER ACFT	12	W30045	177
HOVEY DELTA	-BIRD	A45007	211
HUGHES	500	P40008	178
		P50012	184
LUSCOMBE	8	O34052	076

MANUFACTURER	TYPE	REPORT NUMBER	PAGE (con't)
MITSUBISHI	MU2	W10137	070
NA ROCKWELL	NA16	W40068	123
OSPREY	2	A50013	217
PIETENPOL		O50028	215
PIPER	J5	Q30072	077
	PA14	P40032	162
	PA18	C44011	157
		P40031	160
		P50001	138
		Q50006	166
		W40049	106
	PA22TC	W40031	094
	PA23AP	C40049	101
	PA23AZ	W40077	135
	PA28	C34024	078
		C40084	130
		O40040	055
		O44079	038
	PA31	H40006	021
		O50012	066
		P40015	052
	PA32	A40026	063
		O40803	031
		W40904	114
	PA34	C40907	096
		C44017	029
	PA38	O50007	044
POLISH ACFT	PZL104	P40049	112
QUICKIE	I	P44011	199
RLU	BREEZY	O40055	206
ROBINSON	R22	O40059	180
SIKORSKY	S55	O40077	181
SKYTREK	SKYSEE	P35006	190
STINSON	108	P40057	125
TERRATORN	TIERRA	O45018	203
		O45020	207
ULTRAFLIGHT	LAZAIR	O45014	201
		P45005	200
ZENITH	CH-200	O50090	219

ANNEX 3

LIST OF REPORTS BY PROVINCE/TERRITORY OF OCCURRENCE

REPORT BY PROVINCE/TERRITORY OF OCCURRENCES

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE
Newfoundland & Labrador	84 03 07	A44901	050
	84 09 28	A40024	018
	84 10 11	H40005	056
	85 01 04	A50001	065
	85 05 23	A50901	185
Prince Edward Island	84 02 20	A44006	081
Nova Scotia	84 08 26	A45004	209
	85 04 12	A50006	145
New Brunswick	84 10 11	A45007	211
	84 11 16	A40027	170
	84 12 30	A40026	063
	85 06 04	A50013	217
Quebec	83 10 01	Q30069	156
	83 10 22	Q30072	077
	84 03 09	Q40011	085
	84 06 01	Q40032	095
	85 03 10	Q50006	166
Ontario	83 09 30	O34052	076
	83 11 23	H30007	011
	84 02 20	O44016	005
	84 04 04	C44011	157
	84 04 28	O40801	090
	84 06 17	O40903	006
	84 06 21	O40803	031
	84 06 21	O40804	031
	84 07 04	O45012	196
	84 07 08	O40037	034
	84 07 08	O45013	197
	84 07 12	O45014	201
	84 07 13	C40049	101
	84 07 17	O40040	055
	84 07 19	O40042	035
	84 08 04	O45018	203
	84 08 11	O40054	204
	84 08 12	O40055	206
	84 08 13	O40056	163
	84 08 23	O40059	180
	84 08 25	O45020	207
	84 09 17	O40064	037
	84 09 17	O40077	181
	84 10 20	O44079	038
	84 10 24	O45023	213
	84 11 16	C40089	024
	84 12 02	O40079	137

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE (con't)
Ontario	84 12 09	C40092	025
	85 01 24	O50002	040
	85 02 03	C50008	164
	85 02 16	O50007	044
	85 02 18	O54025	009
	85 03 05	O50012	066
	85 03 09	O50014	165
	85 03 27	O50023	141
	85 04 03	O50024	143
	85 04 29	O50028	215
	85 05 20	O50034	069
	85 06 23	O50047	151
	85 10 11	O50083	168
	85 10 29	O50087	045
	85 11 15	O50090	219
Manitoba	83 12 18	C34901	003
	84 04 15	C44013	015
	84 05 08	C44017	029
	84 06 27	C40040	053
	84 06 28	C40041	158
	84 07 05	C40043	054
	84 09 15	C40080	036
	84 09 16	C40079	118
	84 09 30	C40081	121
	84 10 21	C40084	130
	85 02 16	C50011	042
	85 04 19	C50018	149
Saskatchewan	83 10 30	C34024	078
	84 05 03	C44016	092
	84 06 25	C40906	016
	84 06 25	C40907	096
	84 08 25	C40074	110
	84 11 12	C40088	131
	84 12 11	C40094	061
	84 12 20	C40073	027
Alberta	81 12 06	W10137	070
	83 04 18	W35005	189
	83 07 27	W30035	048
	83 08 20	W35015	192
	84 03 02	W40014	083
	84 05 21	W40031	094
	84 07 11	W40043	099
	84 07 18	W40046	103
	84 07 19	W40048	105
	84 08 05	W40053	108
	84 08 11	W40060	205

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE (con't)
Alberta	84 09 23	W40905	119
	84 09 30	W40068	123
	84 10 01	W40069	127
	84 10 08	W40070	129
	84 10 19	H40006	021
	84 11 23	W40077	135
	85 02 23	W50007	140
	85 03 09	W50010	068
	85 10 02	W50053	155
	86 01 23	H60003	172
British Columbia	83 06 13	P35006	190
	83 06 28	W30028	046
	83 07 24	P34029	074
	83 10 26	P35015	194
	84 02 03	W40006	079
	84 03 29	P40801	087
	84 04 15	P40008	178
	84 05 03	P44003	093
	84 05 11	P40015	052
	84 07 02	W40041	097
	84 07 10	P44011	199
	84 07 10	P45005	200
	84 07 19	P40031	160
	84 07 19	P40032	162
	84 07 21	W40049	106
	84 08 07	P40042	109
	84 09 07	P40049	112
	84 09 10	W40904	114
	84 09 13	P40905	116
	84 10 01	P40057	125
	84 10 04	P40906	128
	84 11 17	P40908	133
	84 12 13	P40063	182
	85 01 06	P50001	138
	85 05 07	P50012	184
NorthWest Territories	85 07 17	W50039	153
Yukon	83 08 28	W30045	177
	85 04 17	W50013	147
	85 08 21	W50905	154